Data Evaluation Record on the Acute Toxicity of Dicamba DGA + Glyphosate Ethanolamine Salt to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number {.....} **EPA MRID Number 50103801**

Data Requirement:
PMRA Data Code: 9.8.4 (TGAI) or 9.8.6 (EP)
EPA DP Barcode:
OECD Data Point: IIA 8.12 (TGAI) and IIIA 10.8.1.1 (EP)
EPA Guideline: 850.4150

Test material: **MON 76832 Formulation (Dicamba DGA + Glyphosate Ethanolamine Salt)**
A.I. Dicamba acid **Purity:** 9.9%
A.I. Glyphosate acid **Purity:** 19.2%
Common name:
Chemical name: IUPAC:
CAS name:
CAS No.:
Synonyms:

Primary Reviewer: Michael Wagman **Date:** {.....}
{ERB6/EFED/OCSPP/EPA}

MICHAEL WAGMAN Digitally signed by MICHAEL WAGMAN Date: 2018.10.31 17:05:28 -04'00'

Secondary Reviewer(s): Brian D. Kiernan **Date:** {.....}
{ERB6/EFED/OCSPP/EPA}

This Data Evaluation Record may have been altered by the Environmental Fate and Effects Division subsequent to signing by CDM/CSS-Dynamac JV personnel.

Reference/Submission No.: {.....}

Company Code {.....} [For PMRA]
Active Code {.....} [For PMRA]
Use Site Category: {.....} [For PMRA]
EPA PC Code: **128931 (Dicamba DGA)**
103605 (Glyphosate ethanolamine salt)
Date Evaluation Completed: {dd-mm-yyyy}

CITATION: McKelvey, R.A, J.R. Porch, and A. Siddiqui. 2016. MON 76832: A Toxicity Test to Determine the Effects on Vegetative Vigor of Eight Species of Plants. Unpublished study performed by EAG Laboratories (formerly known as Wildlife International), Easton, Maryland, and sponsored by Monsanto Company, St. Louis, MO. Wildlife International Project No. 139P-130; Monsanto Study No. MSL0028205. Study completed November 10, 2016.

EXECUTIVE SUMMARY:

The effect of **MON 76832 (Dicamba DGA + Glyphosate ethanolamine salt)** on the vegetative vigor of monocot (corn, *Zea mays*; onion, *Allium cepa*; ryegrass (*Lolium perenne*; and wheat, *Triticum aestivum*), and dicot (cabbage, *Brassica oleracea*; carrot, *Daucus carota*; lettuce, *Lactuca sativa*; and oilseed rape, *Brassica napus*) crops was studied. Nominal concentrations of Dicamba acid were 0 (negative control), 0.00023, 0.00069, 0.0021, 0.0062, 0.019, 0.056, and 0.17 lb ae/A Dicamba acid (wheat and lettuce); 0 (negative control), 0.00069, 0.0021, 0.0062, 0.019, 0.056, and 0.17 lb ae/A Dicamba acid (corn, onion, carrot, lettuce, and oilseed rape); 0 (negative control), 0.0021, 0.0062, 0.019, 0.056, 0.17, and 0.51 lb ae/A Dicamba acid (cabbage), and 0 (negative control), 0.0062, 0.019, 0.056, 0.17, 0.51, and 1.5 lb ae/A Dicamba acid (ryegrass). Nominal concentrations of Glyphosate acid were 0 (negative control), 0.00045, 0.0013, 0.0040, 0.012, 0.037, 0.11, and 0.33 lb ae/A Glyphosate acid (wheat and lettuce); 0 (negative control), 0.0013, 0.0040, 0.012, 0.037, 0.11, and 0.33 lb ae/A Glyphosate acid (corn, onion, carrot, lettuce, and oilseed rape); 0 (negative control), 0.0040, 0.012, 0.037, 0.11, 0.33, and 0.98 lb ae/A Glyphosate

acid (cabbage); and 0 (negative control), 0.012, 0.037, 0.11, 0.33, 0.98, and 2.9 lb ae/A Glyphosate acid (ryegrass). In terms of total product, nominal concentrations of MON 76832 were 0 (negative control) and 0.0023, 0.0070, 0.021, 0.063, 0.19, 0.57, and 1.7 lb product/A (wheat and lettuce); 0 (negative control), 0.0070, 0.021, 0.063, 0.19, 0.57 and 1.7 lb product/A (corn, onion, carrot, lettuce and oilseed rape); 0 (negative control), 0.063, 0.19, 0.57, 1.7, 5.1 and 15.3 lb product/A (ryegrass).

Concentrations of both Dicamba and Glyphosate were analytically confirmed at all treatment levels, and corresponding measured concentrations were <0.00014 (LOQ, negative control), 0.00023, 0.00068, 0.0021, 0.0064, 0.019, 0.057, 0.17, and 0.50 lb ae/A Dicamba acid (cabbage, carrot, lettuce and oilseed rape); <0.00014 (LOQ, negative control), 0.00022, 0.00067, 0.0020, 0.0060, 0.018, 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid (corn, onion, ryegrass, and wheat); <0.00018 (LOQ, negative control), 0.00042, 0.0013, 0.0037, 0.012, 0.035, 0.11, 0.32, and 0.97 lb ae/A Glyphosate acid (cabbage, carrot, lettuce and oilseed rape); and <0.00018 (LOQ, negative control), 0.00042, 0.0013, 0.0038, 0.012, 0.035, 0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid (corn, onion, ryegrass, and wheat).

The growth medium used in the vegetative vigor test was a kaolinite clay, sand and peat mix (loamy sand, pH 6.9, organic carbon 1.1%). On day 21 the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight.

Survival in the negative control was 97-100%. The reviewer found significant inhibitions in survival in all species tested compared to the negative control. Significant survival inhibitions in carrot were 10 and 40%, and in lettuce were 28 and 72%, at 0.057 and 0.17 lb ae/A Dicamba acid measured concentrations, respectively (0.11 and 0.32 lb ae/A Glyphosate acid); significant survival inhibitions in ryegrass were 33, 67, and 93% at 0.16, 0.49, and 1.4 lb ae/A Dicamba acid, respectively (0.33, 1.0, and 3.3 lb ae/A Glyphosate acid); Jonckheere-Terpstra Step-Down test, $p<0.05$. Significant decreases in corn survival of 23 and 93% were found at 0.055 and 0.16 lb ae/A Dicamba acid, respectively (0.11 and 0.33 lb ae/A Glyphosate acid), and significant decreases in cabbage survival of 23 and 73% were found at 0.17 and 0.50 lb ae/A Dicamba acid measured concentrations, respectively (0.32 and 0.97 lb ae/A Glyphosate acid measured concentrations); Mann-Whitney U Two-Sample test, $p<0.05$. In addition, significant inhibitions in oilseed rape, onion, and wheat survival were 50, 23 and 90% at 0.16/0.17 lb ae/A Dicamba acid measured concentrations, respectively, (0.32/0.33 lb ae/A Glyphosate acid measured concentrations), compared to the negative control; Mann-Whitney U Two-Sample test, $p<0.05$.

Significant inhibitions in seedling height were also found in all species tested compared to the negative control. Significant inhibitions in carrot height were 10, 48 and 68%, in lettuce height were 22, 67, and 76%, and in wheat height were 6, 39, and 57% at 0.18/0.019, 0.055/0.057, and 0.16/0.17 lb ae/A measured Dicamba acid, respectively (0.035, 0.11 and 0.32/0.33 lb ae/A measured Glyphosate acid); Williams test, $p<0.05$. Significant inhibitions in corn height were 54 and 75%, and in oilseed rape height were 19 and 74%, at 0.055/0.057 and 0.16/0.17 lb ae/A measured Dicamba acid, respectively (0.11 and 0.32/0.33 lb ae/A measured Glyphosate acid); significant inhibition in cabbage height was 35, 63, and 68% at 0.057, 0.17, and 0.50 lb ae/A Dicamba acid measured concentrations, respectively (0.11, 0.32, and 0.97 lb ae/A measured Glyphosate acid);Williams test, $p<0.05$. In addition, significant decreases in onion height of 29 and 60% were found at 0.055 and 0.16 lb ae/A Dicamba acid measured concentrations, respectively (0.11 and 0.33 lb ae/A Glyphosate acid), and significant decreases in ryegrass height of 15, 54, 66, and 57% were found at 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid measured concentrations, respectively (0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid measured concentrations) compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$.

The reviewer also found significant inhibitions in seedling dry weight in all species tested compared to the negative control. Significant inhibitions in corn dry weight were 20, 75, and 95% at 0.018, 0.055 and 0.16 lb ae/A Dicamba acid measured concentrations, respectively (0.035, 0.11 and 0.33 lb ae/A Glyphosate acid measured concentrations); significant inhibitions in onion dry weight were 59 and 75%, and in wheat dry weight were 76 and 94%, at 0.055 and 0.16 lb ae/A Dicamba acid measured concentrations, respectively (0.11 and 0.33 lb ae/A Glyphosate acid measured concentration); Williams test, $p<0.05$). For oilseed rape dry weight significant inhibitions were 13, 12, 24,

72, and 95%, at 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A Dicamba acid measured concentrations, respectively (0.0037, 0.012, 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid measured concentrations); Jonckheere-Terpstra Step-Down test, $p<0.05$. Significant decreases in carrot dry weight were 18, 31, 83, and 90% at 0.0064, 0.019, 0.057 and 0.17 lb ae/A Dicamba acid measured concentrations (0.012, 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid measured concentrations); in cabbage dry weight were 18, 78, 93, and 94% at 0.019, 0.057, 0.17, and 0.50 lb ae/A Dicamba acid measured concentrations (0.035, 0.11, 0.32, and 0.97 lb ae/A Glyphosate acid measured concentrations); and in ryegrass dry weight were 46, 88, 92, and 92% at 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid measured concentrations (0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid measured concentrations), respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

For lettuce dry weight, significant inhibitions were 19, 35, 69, 91, and 95%, at 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A measured dicamba acid (0.012, 0.035, 0.11 and 0.32 lb ae/A glyphosate acid);Jonchkeere-Terpstra Step-Down Test, $p<0.05$. However, it should be noted that although the 19% inhibition at the 0.0021 lb ae/A dicamba acid application rate was found to be statistically significant, the 20% inhibition found at the next lowest dose (0.00068 lb ae/A dicamba acid) was not statistically significant, likely due to slightly higher variability (Jonchkeere-Terpstra Step-Down Test, $p = 0.12$, CV of 38.3%). As the observed effects in these two concentrations were essentially the same, the reviewer determined that the biological NOAEC should therefore be established at the 0.00023 lb ae/A dicamba acid concentration (0.00042 lb ae/A glyphosate acid) and the LOAEC should therefore be considered the 0.00068 lb ae/A dicamba acid concentration (0.0013 lb ae/A glyphosate acid).

Based on the reviewer's results, the most sensitive monocot was wheat, based on dry weight, with NOAEC, IC_{05} and IC_{25} values in terms of measured Dicamba acid concentrations of 0.018, 0.0118 and 0.0221 lb ae/A, and in terms of Glyphosate acid measured concentrations of 0.035, 0.0228 and 0.0432 lb ae/A, respectively. However, as these values indicate that the statistical wheat NOAEC and IC_{25} endpoints are essentially indistinguishable, the reviewer finds that the regression-based IC_{05} would be more appropriate for quantitative use in risk assessment and be more likely to be protective of risks to listed species, rather than the NOAEC. The most sensitive dicot was lettuce, based on dry weight, with NOAEC and IC_{25} values in terms of measured Dicamba acid concentrations of 0.00023 and 0.00223 lb ae/A, respectively, and in terms of Glyphosate acid measured concentrations of 0.00042 and 0.00398 lb ae/A, respectively.

Based on reviewer calculated total formulation concentrations (based on nominal application rates), the most sensitive monocot species was wheat, based on dry weight, with IC_{05} and IC_{25} values of 0.117 and 0.20 lb total formulation/A, respectively; and the most sensitive dicot species was lettuce, based on dry weight, with NOAEC and IC_{25} values of 0.0023 and 0.023 lb total formulation/A (nominal concentrations), respectively.

Note: for dicots, the IC_{25} for tomato dry weight of 0.00191 lb ae/A Dicamba acid (0.00373 lb ae/A Glyphosate acid), from the earlier study MRID 49953901, was lower than the IC_{25} for the most sensitive dicot, lettuce, in this study.

The occurrence of phytotoxic visual effects (referred in the study report as "plant condition" was determined from observation. The severity of effects ranged from none to severe effects in all species tested, including plant death in all species. Phytotoxic effects included chlorosis, necrosis, and leaf curl; phytotoxic effects exhibited a dose-response relationship.

Maximum Labeled Rate: Not reported

Results Synopsis

Dicamba Acid (based on measured concentrations)

Monocot

Most sensitive monocot: Wheat, based on dry weight

EC_{50}/IC_{50}: 0.0342 lb ae/A	95% C.I.: 0.0297-0.0394 lb ae/A
EC_{25}/IC_{25}: 0.0221 lb ae/A	95% C.I.: 0.0179-0.0263 lb ae/A
EC_{05}/IC_{05}: 0.0118 lb ae/A	95% C.I.: N/A-0.0151 lb ae/A
NOAEC: 0.018 lb ae/A	

The reviewer determined that the IC_{05} of 0.0118 lb ae/A dicamba acid to be a more appropriate endpoint to use to quantitatively evaluate risks to listed monocot species than the NOAEC for this species endpoint.

Dicot

Most sensitive dicot: Lettuce, based on dry weight

EC_{50}/IC_{50}: 0.00744 lb ae/A	95% C.I.: 0.00453-0.0122 lb ae/A
EC_{25}/IC_{25}: 0.00223 lb ae/A	95% C.I.: 0.000986-0.00412 lb ae/A
EC_{05}/IC_{05}: 0.000392 lb ae/A	95% C.I.: N/A-0.00112 lb ae/A
NOAEC: 0.00023 lb ae/A	

Glyphosate Acid (based on measured concentration)

Monocot

Most sensitive monocot: Wheat, based on dry weight

EC_{50}/IC_{50}: 0.0675 lb ae/A	95% C.I.: 0.0584-0.0781 lb ae/A
EC_{25}/IC_{25}: 0.0432 lb ae/A	95% C.I.: 0.0349-0.0515 lb ae/A
EC_{05}/IC_{05}: 0.0228 lb ae/A	95% C.I.: N/A-0.0292 lb ae/A
NOAEC: 0.035 lb ae/A	

The reviewer determined that the IC_{05} of 0.0228 lb ae/A glyphosate acid to be a more appropriate endpoint to use to quantitatively evaluate risks to listed monocot species than the NOAEC for this species endpoint.

Dicot

Most sensitive dicot: Lettuce, based on dry weight

EC_{50}/IC_{50}: 0.0136 lb ae/A	95% C.I.: 0.00823-0.0225 lb ae/A
EC_{25}/IC_{25}: 0.00398 lb ae/A	95% C.I.: 0.00176-0.00739 lb ae/A
EC_{05}/IC_{05}: 0.00068 lb ae/A	95% C.I.: N/A-0.00198 lb ae/A
NOAEC: 0.00042 lb ae/A	

Mon 76832 Formulation (based on nominal concentration)

Monocot

Most sensitive monocot: Wheat, based on dry weight

EC_{50}/IC_{50}: 0.345 lb product/A	95% C.I.: 0.298--0.399 lb product/A
EC_{25}/IC_{25}: 0.202 lb product/A	95% C.I.: 0.161-0.253 lb product/A

EC_{05}/IC_{05}: 0.117 lb product/A
NOAEC: 0.192 lb product/A
The reviewer determined that the IC_{05} of 0.117 lb/A MON 76832 formulation to be a more appropriate endpoint to use to quantitatively evaluate risks to listed monocot species than the NOAEC for this species.

Dicot

Most sensitive dicot: Lettuce, based on dry weight

EC_{50}/IC_{50}: 0.0737 lb product/A 95% C.I.: 0.0401—0.135 lb product/A
EC_{25}/IC_{25}: 0.0229 lb product/A 95% C.I.: 0.00947—0.0555 lb product/A
NOAEC: 0.0023 lb product/A

Table 1 (Tier II studies). Summary of most sensitive parameters by species (lb ae/A Dicamba acid).

Species	Endpoint	NOAEC[1]	EC_{25}/IC_{25}	EC_{50}/IC_{50}
Cabbage	Dry weight	0.0064	0.0211	0.0337
Carrot	Dry weight	0.0021	0.016	0.0298
Corn	Dry weight	0.0060	0.0246	0.0378
Lettuce	Dry weight	0.00023	0.00223	0.00744
Oilseed Rape	Dry weight	0.00068	0.0221	0.0382
Onion	Dry weight	0.00705[2]	0.0244	0.0578
Ryegrass	Dry weight	0.018	0.0311	0.0575
Wheat	Dry weight	0.0118[2]	0.0221	0.0342

[1] IC_{05} used when NOAEC undefined/not suitable for risk assessment
[2] IC_{05} presented in place of NOAEC

Table 1a (Tier II studies). Summary of most sensitive parameters by species (lb ae/A Glyphosate acid).

Species	Endpoint	NOAEC[1]	EC_{25}/IC_{25}	EC_{50}/IC_{50}
Cabbage	Dry weight	0.012	0.039	0.0637
Carrot	Dry weight	0.0037	0.029	0.0558
Corn	Dry weight	0.012	0.0482	0.0749
Lettuce	Dry weight	0.00042	0.00398	0.0136
Oilseed Rape	Dry weight	0.0013	0.041	0.0723
Onion	Dry weight	0.0133[2]	0.0476	0.116
Ryegrass	Dry weight	0.035	0.0612	0.115
Wheat	Dry weight	0.0228[2]	0.0432	0.0675

[1] IC_{05} used when NOAEC undefined/not suitable for risk assessment
[2] IC_{05} presented in place of NOAEC

This study is scientifically sound and is classified as **acceptable** in combination with the data on two additional species (soybean and tomato) included in MRID 49953901.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted in compliance with OCSPP Guideline 850.4150: Vegetative Vigor (January 2012). The reviewer evaluated the study methods according to EPA Ecological Effects Test Guidelines, OCSPP Guideline 850.4150: Vegetative Vigor. There were some deficiency and deviations noted by the reviewer.

1. Four dicots were included in this study. EPA guidance recommends testing six dicots. An earlier study,

MRID 49953901, completed June 22, 2016, included two additional dicots (soybean and tomato).

2. CEC and percent moisture were not reported.

3. The physico-chemical properties of the test material were not reported.

The deficiency and deviations did not have an impact on the acceptability of this study.

COMPLIANCE: Signed and dated GLP, Quality Assurance and Data Confidentiality statements were provided. This study was conducted in compliance with USEPA Good Laboratory Practice Standards (40 CFR, Part 160, 1989), with the following exceptions: periodic analyses of well water for potential contaminants were not performed according to GLP standards, but were performed using a certified laboratory and standard EPA methods.

A. MATERIAL

1. Test Material: **MON 76832 (Dicamba DGA + Glyphosate ethanolamine salt)**

Description: Green Liquid

Lot No./Batch No.: GLP-1304-22586-F; expiration date February 10, 2017

Purity: Dicamba Acid: 9.9%
Glyphosate Acid: 19.2%

Stability of compound under test conditions: Recoveries of Dicamba acid from the spray solutions were 93-102% (n=25). Dicamba spike recoveries were 89-102% (n=4). Recoveries of Glyphosate acid from the spray solutions were 93-106% (n=24), with one additional recovery of 129% at the highest test concentration. Glyphosate spike recoveries were 93-105% (n=5). Stability was not determined.

(OECD recommends chemical stability in water and light)

Storage conditions of test chemicals: The test material was stored under ambient conditions in darkness.

Table 2. Physical/chemical properties of Dicamba DGA + Glyphosate ethanolamine salt.

Parameter	Values	Comments
Water solubility at 20°C	Not reported	
Vapor pressure	Not reported	
UV absorption	Not reported	
pKa	Not reported	
Kow	Not reported	

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Poaceae; Nothstine Dent); Onion (*Allium cepa*, Liliaceae, Yellow Granex Hybrid 33); Ryegrass (*Lolium perenne*; Poaceae; Gator 3); and Wheat (*Triticum aestivum*, Poaceae; Glenn Hard Red). *EPA recommends four monocots in two families, including corn.*
Dicotyledonous species: Cabbage (*Brassica oleracea*, Brassicaceae; All Seasons), Carrot (*Daucus carota*, Scarlet Nantes), Lettuce (*Lactuca sativa*, Asteraceae; Iceburg), and Oilseed rape (*Brassica napus*, Brassicaceae; Dwarf Essex). *EPA recommends six dicots in four families, including soybean and a root crop.*

OECD recommends a minimum of three species selected for testing, at least one from each of the following categories: Category 1: ryegrass, rice, oat, wheat, and sorghum; Category 2: mustard, rape, radish, turnip, and Chinese cabbage; Category 3: vetch, mung bean, red clover, fenugreek, lettuce, and cress.

Seed source: Corn, wheat and oilseed rape obtained from Johnny's Selected Seeds; onion obtained from Park Seed Company; ryegrass and carrot obtained from Meyer Seed Company; and cabbage and lettuce obtained from Sustainable Seed Company.
Prior seed treatment/sterilization: The seeds were not treated with any type of fungicides, insecticides, or any pesticides.
Historical % germination of seed: Corn, 94%; Onion, 90%; Ryegrass, 90%; Wheat, 89%; Cabbage, 90%; Carrot, 80%; Lettuce, 88%; and Oilseed Rape, 96%.
Seed storage, if any: Not reported.

B. STUDY DESIGN:

1. Experimental Conditions

a. Limit test: None.

b. Range-finding study: None.

c. Definitive Study

Table 3: Experimental Parameters - Vegetative Vigor.

Data Evaluation Record on the Acute Toxicity of Dicamba DGA + Glyphosate Ethanolamine Salt to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number {.....} **EPA MRID Number 50103801**

Parameters	Vegetative Vigor	
	Details	**Remarks** *Criteria*
Duration of the test	21 days	*Recommended test duration is 14-21 days.* *OECD recommends that the test be terminated no sooner than 14 days after 50 percent of the control seedlings have emerged*
Number of seeds/plants/species/ replicate	5 seedlings per replicate, 1 seedling per pot.	*Five plants per replicate are recommended.*
Number of plants retained after thinning	Thinned to one plant per pot (if necessary).	
Number of replicates Control: Adjuvant control: Treated:	6 N/A 6	*Four replicates per dose should be used.* *OECD recommends a minimum of four replicates per treatment*

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PMRA Submission Number {.....} **EPA MRID Number 50103801**

Parameters	Vegetative Vigor	
	Details	**Remarks** *Criteria*
Test concentrations (lb ai/A) Nominal:	Dicamba acid 0 (negative control), 0.00023, 0.00069, 0.0021, 0.0062, 0.019, 0.056, 0.17, 0.51, and 1.5 lb ae/A Dicamba acid. Glyphosate acid 0 (negative control), 0.00045, 0.0013, 0.0040, 0.012, 0.037, 0.11, 0.33, 0.98, and 2.9 lb ae/A Glyphosate acid.	Nominal concentrations for MON 76832 formulation: 0.0023, 0.0070, 0.021, 0.063, 0.19, 0.57, 1.7, 5.1 and 15 lb lb formulation/A. *Five test concentrations should be used with a dose range of 2X or 3X progression* *OECD recommends three concentrations, preferably with application rates equivalent to 0.0 (control), 1.0, 10.0 and 100 mg substance per kg of oven-dried soil.*
Measured:	Cabbage, carrot, lettuce and oilseed rape: Dicamba acid <0.00014 (LOQ, negative control), 0.00023, 0.00068, 0.0021, 0.0064, 0.019, 0.057, 0.17, and 0.50 lb ae/A Dicamba acid. Glyphosate acid <0.00018 (LOQ, negative control), 0.00042, 0.0013, 0.0037, 0.012, 0.035, 0.11, 0.32, and 0.97 lb ae/A Glyphosate acid. Corn, onion, ryegrass, and wheat: Dicamba acid <0.00014 (LOQ, negative control), 0.00022, 0.00067, 0.0020, 0.0060, 0.018, 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid. Glyphosate acid <0.00018 (LOQ, negative control), 0.00042, 0.0013, 0.0038, 0.012, 0.035, 0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid.	

Data Evaluation Record on the Acute Toxicity of Dicamba DGA + Glyphosate Ethanolamine Salt to Terrestrial Vascular Plants: Vegetative Vigor

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Parameters	Vegetative Vigor	
	Details	**Remarks** *Criteria*
Method and interval of analytical verification LOQ: LOD:	Spray solutions were analyzed by HPLC using an Agilent Model 1100/1200 with an Agilent series 1100/1200 VWD. 0.00014 lb ae/A Dicamba 0.00018 lb ae/A Glyphosate acid. Not reported.	Both Dicamba acid and Glyphosate acid were analytically confirmed.
Adjuvant (type, percentage, if used)	N/A	
Test container (pot) Size/Volume Material: (glass/polystyrene)	Pots with diameter of 11 cm x 10 cm depth. Plastic	*Non-porous containers should be used.* *OECD recommends that non-porous plastic or glazed pot be used.*
Growth facility	Greenhouse	
Method/depth of seeding	Onion, ryegrass, cabbage carrot, lettuce and oilseed rape at 10 mm depth. Corn and wheat at 20 mm depth.	
Test material application Application time including the plant growth stage Number of applications Application interval Method of application	 After planting 1 N/A- single application Application of the test substance was made using an overhead track sprayer (De Vries) equipped with a TeeJet 8002E nozzle operated at 20 psi, approximately 41 cm above the soil surface (200 L/ha nominal spray volume)	
Details of soil used Geographic location Depth of soil collection	 N/A N/A	Mixture of kaolinite clay, sand and peat, with limestone added to buffer the pH. Organic Matter: 1.9%

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Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Loamy sand 88 6 6 6.9 1.1% Not reported Not reported	*Soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter are preferable. Glass beads, rock wool, and 100% acid washed sand are not preferred.* *OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.*
Details of nutrient medium, if used	Slow-release fertilizer was added to provide nutrients essential for plant growth.	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Top watered once post-application, then sub-irrigation. Well water. Not reported. Daily. The plants were bottom watered daily as needed.	*EPA prefers that bottom watering be utilized for Vegetative Vigor studies so that the chemical is not leached out of the soil during the test.*
Any pest control method/fertilization, if used	Not reported.	
<u>Test conditions</u> Temperature: Photoperiod:	<u>Cabbage, carrot, lettuce and oilseed rape:</u> Mean 24.18°C, range 17.64-32.84°C 16L:8D Natural sunlight supplemented	

Parameters	Vegetative Vigor	
	Details	**Remarks**
		Criteria
	with artificial light.	*EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.*
Light intensity and quality:	Mean 13.0 moles PAR, range 9.4-16.4 moles PAR	
Relative humidity:	Mean 68.05%, range 34.86-91.00%	*OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.*
	Corn, onion, ryegrass and wheat:	
Temperature:	Mean 23.61°C, range 16.78-31.87°C	
Photoperiod:	16L:8D Natural sunlight supplemented with artificial light.	
Light intensity and quality:	Mean 13.7 moles PAR, range 11.1-16.5 moles PAR	
Relative humidity:	Mean 67.87%, range 22.94-91.00%	
Reference chemical (if used) Name: Concentrations:	N/A	
Other parameters, if any	None	

2. Observations:

Table 4: Observation Parameters - Vegetative Vigor.

Parameters	Vegetative Vigor	
	Details	**Remarks**
Parameters measured (e.g., number of germinated seeds, emerged seedlings, plant height, dry weight or other endpoints)	- Survival - Shoot height - Mean dry weight - Phytotoxicity	
Measurement technique for each parameter	Phytotoxicity and survival were visually determined. Height was measured from the surface of the soil to the apical meristem. Mean dry weight was determined following drying (drying time and temperature not reported.)	
Observation intervals	Each pot was inspected weekly, survival determined. Dry weight and shoot height were recorded at study termination.	
Other observations, if any	N/A	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	No effect, 0; slight effect, 10-30, moderate effect, 40-60; severe effect, 70-90; complete effect/plant death, 100.	Frans, R.E. and R.E. Talbert, 1977.

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

1. Vegetative Vigor:

Survival in the negative control was 97-100%. The study author found significant inhibitions in survival in all species tested compared to the negative control. Based on nominal concentrations, the significant inhibitions in carrot survival were 10 and 40%, in corn were 23 and 93% and in lettuce were 28 and 72%, at the 0.056 and 0.17 lb ae/A dicamba concentrations, respectively (0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively Dunnett's test, $p<0.05$). Significant decreases in cabbage survival were also

23 and 73% at 0.17 and 0.51 lb ae/A, respectively, nominal Dicamba acid concentrations (0.33 and 0.98 lb ae/A nominal Glyphosate acid, respectively, and in ryegrass survival were 33, 67, and 93% at 0.17, 0.51, and 1.5 lb ae/A nominal Dicamba acid concentrations, respectively (0.32, 0.98, and 2.9 lb ae/A nominal Glyphosate acid concentrations; Dunnett's test, $p<0.05$). Significant inhibitions in oilseed rape, onion, and wheat survival were 50, 23 and 90% at the 0.17 lb ae/A nominal Dicamba acid treatment concentration (0.32 nominal lb ae/A Glyphosate acid treatment levels), compared to the negative control (Dunnett's test, $p<0.05$).

The study author also found significant inhibitions in seedling height in all species tested compared to the negative control. Based on nominal concentrations, significant inhibitions in carrot height were 10, 48 and 68%, in wheat height were 6, 39, and 57%, and in lettuce height were 22, 67, and 76%, at the 0.019, 0.056 and 0.17 lb ae/A dicamba acid concentrations, respectively (0.037, 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels), compared to the negative control (Dunnett's test, $p<0.05$).In addition, the study author reported that significant inhibitions in corn height were 54 and 75%, in oilseed rape height were 19 and 73%, and in onion height were 29 and 60%, at the 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations, respectively (0.11 and 0.33 lb ae/A nominal Glyphosate acid;) Dunnett's test, $p<0.05$). Significant decreases in cabbage height of 35, 63, and 68% were observed at 0.056, 0.17 and 0.51 lb ae/A nominal dicamba acid concentrations, respectively (0.11, 0.33, and 0.98 lb ae/A nominal Glyphosate acid), and significant decreases in ryegrass height of 15, 54, 66, and 57% were found at 0.056, 0.17, 0.51 and 1.5 lb ae/A nominal dicamba acid concentrations, respectively (0.11, 0.33, 0.98, and 2.9 lb ae/A nominal Glyphosate acid), compared to the negative control (Dunnett's test, $p<0.05$).

The study author found significant inhibitions in seedling dry weight in all species tested compared to the negative control. Significant inhibitions in oilseed rape dry weight were 13, 12, 24, 72, and 95% at the 0.0021, 0.0062, 0.019 and 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations, respectively (0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively; Dunnett's test, $p<0.05$). Significant inhibitions in carrot dry weight were 18, 31, 83, and 90%, and in lettuce dry weight were 35, 69, 91, and 95%, at 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations (0.012, 0.037, 0.11 and 0.33 lb ae/A nominal Glyphosate acid, respectively; Dunnett's test, $p<0.05$). In addition, significant inhibitions in cabbage dry weight were 18, 78, 93, and 94% at 0.019, 0.056, 0.17 and 0.51 lb ae/A nominal dicamba acid concentrations, respectively (0.037, 0.11, 0.33, and 0.98 lb ae/A nominal Glyphosate acid, respectively) and in corn dry weight, were 20, 75, and 95% at 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations, respectively (0.037, 0.11 and 0.33 lb ae/A nominal Glyphosate acid; Dunnett's test, $p<0.05$). Significant decreases in onion dry weight measured 59 and 75%, and in wheat dry weight measured 76 and 94%, at 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations, respectively (0.11 and 0.33 lb ae/A nominal Glyphosate acid, respectively), compared to the negative control (Dunnett's test, $p<0.05$). Significant inhibitions in ryegrass dry weight of 46, 89, 92, and 92% were observed at the 0.056, 0.17, 0.51 and 1.5 lb ae/A nominal dicamba acid concentrations, respectively (0.11, 0.33, 0.98, and 2.9 lb ae/A nominal Glyphosate acid treatment levels, respectively, compared to the negative control; Dunnett's test, $p<0.05$).

The study author determined the most sensitive monocot was ryegrass, based on dry weight, with NOER and ER_{25} values of 0.019 and 0.017 lb ae/A nominal dicamba acid concentrations, respectively (0.037 and 0.034 lb ae/A nominal Glyphosate acid, respectively), and the most sensitive dicot was lettuce, based on dry weight, with NOER and ER_{25} values of 0.0021 and 0.0022 lb ae/A nominal dicamba acid concentrations, respectively (0.0040 and 0.0044 lb ae/A Glyphosate acid, respectively). In terms of nominal formulation concentrations, the NOER and ER_{25} were reported to be 0.192 and 0.178 lb/A MON 76832, respectively, for ryegrass, and 0.021 and 0.023 lb/A MON 76832, respectively, for lettuce.

The occurrence of phytotoxic effects was determined from visual observation. There were none to severe (0-100) effects in all species tested, including plant death in all species. Phytotoxic effects included chlorosis, necrosis, and leaf curl; phytotoxic effects were dose-related. Mean onion plant conditions on day

21 were 3, 10, 6, 8, 12, 29 and 66 in the negative control, 0.00703, 0.02077, 0.0631, 0.192, 0.567, and 1.68 lb/A nominal MON 76832 concentrations (0, 0.00069, 0.0021, 0.0062, 0.019, 0.056, 0.17 lb ae/A nominal dicamba acid and 0, 0.0013, 0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A nominal glyphosate acid, respectively). For ryegrass, mean plant conditions on Day 21 were 1, 1, 7, 18, 79, 95, and 99 in the negative control, 0.0631, 0.192, 0.567, 1.68, 5.11 and 15.3 nominal MON 76832 concentrations (0, 0.0062, 0.019, 0.056, 0.17, 0.51 and 1.5 lb ae/A nominal dicamba acid and 0, 0.012, 0.037, 0.11, 0.33, 0.98 and 2.9 lb ae/A nominal glyphosate acid, respectively). Mean wheat plant conditions were 0, 2, 7, 9, 9, 13, 44, and 98 in the negative control, 0.00232, 0.00703, 0.0208, 0.0631, 0.192, 0.567, and 1.68 lb/A nominal MON 76832 concentrations (0, 0.00023, 0.00069, 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid concentrations and 0, 0.00045, 0.0013, 0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A nominal glyphosate acid concentrations). Mean corn plant conditions were 1, 7, 12, 13, 16, 61, and 98 in the negative control, 0.00703, 0.0208, 0.0631, 0.192, 0.567, and 1.68 lb/A nominal MON 76832 concentrations, respectively (0, 0.00069, 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid and 0, 0.0013, 0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A nominal glyphosate acid). Mean oilseed rape plant conditions were 0, 4, 4, 7, 14, 31, and 87 in the negative control, 0.00703, 0.0208, 0.0631, 0.192, 0.567 and 1.68 lb/A nominal MON 76832 concentrations, respectively (0, 0.00069, 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid and 0, 0.0013, 0.0040, 0.012, 0.037, 0.11, and 0.33 lb ae/A nominal glyphosate acid). Mean cabbage plant conditions were 0, 3, 6, 11, 39, 77 and 95 in the negative control, 0.0208, 0.0631, 0.192, 0.567, 1.68 and 5.11 lb/A nominal MON 76832 concentrations, respectively (0, 0.0021, 0.0062, 0.019, 0.056, 0.17 and 0.51 lb ae/A nominal dicamba acid and 0, 0.0040, 0.012, 0.037, 0.11, 0.33 and 0.98 lb ae/A nominal glyphosate acid). Mean carrot plant conditions were 0, 5, 2, 5, 12, 44 and 75 in the negative control, 0.00703, 0.0208, 0.0631, 0.192, 0.567 and 1.68 lb/A nominal MON 76832 concentrations, respectively (0, 0.00069, 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid and 0, 0.0013, 0.0040, 0.012, 0.037, 0.11, and 0.33 nominal glyphosate acid). Mean lettuce plant conditions were 3, 11, 18, 21, 23, 45, 81, and 95 in the negative control, 0.00232, 0.00703, 0.0208, 0.0631, 0.192, 0.567 and 1.68 lb/A nominal MON 76832 (0, 0.00023, 0.00069, 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A nominal dicamba acid and 0, 0.00045, 0.0013, 0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A nominal glyphosate acid).

B. REPORTED STATISTICS:

Survival, replicate shoot dry weight, and height mean and standard deviations were determined. Dunnett's test was used to establish the LOER and NOER by determining which treatment groups differed significantly (one-tailed, $p < 0.05$) from the control group. Mean survival, dry weight, and height of the control and treatment groups were compared using the DUNNETT option of the GLM (general linear model) procedure of SAS version 9.4. Statistical analyses for species also included, if appropriate, the determination of effect rates (ER estimates) and their confidence limits using the non-linear regression analysis of Bruce and Versteeg when reductions in test endpoints among one or more treatment groups were 25% or more relative to control means. Analyses were conducted using the NLIN procedure of SAS version 9.4. Nominal concentrations were used for all analyses.

Table 5: Reported Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	**Results summary for height in lbs ae/A Dicamba Acid (lbs ae/A Glyphosate acid)***							
	height (cm)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	8.25-27.6	0.019 (0.037)	ND	N/A	0.033 (0.064)	0.018—0.059 (0.035-0.12)	0.12 (0.24)	0.088—0.18 (0.17-0.34)

Species	Results summary for height in lbs ae/A Dicamba Acid (lbs ae/A Glyphosate acid)*							
	height (cm)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Carrot[2]	11.4-35.5	0.0062 (0.012)	ND	N/A	0.030 (0.058)	0.023—0.040 (0.044--0.077)	0.079 (0.15)	0.068—0.093 (0.13-0.18)
Corn[3]	28-113	0.019 (0.037)	ND	N/A	0.030 (0.057)	0.023-0.039 (0.044--0.075)	0.063 (0.12)	0.053—0.075 (0.10--0.15)
Lettuce[4]	6.5-29.2	0.006 (0.012)	ND	N/A	0.015 (0.030)	0.0098—0.024 (0.019--0.046)	0.043 (0.083)	0.033—0.056 (0.064--0.11)
Oilseed Rape[5]	9.88-38.2	0.019 (0.037)	ND	N/A	0.064 (0.12)	0.051—0.080 (0.10--0.15)	0.10 (0.20)	0.092—0.12 (0.18--0.23)
Onion[6]	11.5-28.9	0.019 (0.037)	ND	N/A	0.054 (0.11)	0.039—0.074 (0.076--0.14)	0.12 (0.24)	0.10—0.15 (0.20--0.29)
Ryegrass[7]	10.8-33.1	0.019 (0.037)	ND	N/A	0.042 (0.082)	0.015—0.12 (0.028--0.24)	0.22 (0.43)	0.12—0.41 (0.23-0.79)
Wheat[8]	24.5-57.1	0.006 (0.012)	ND	N/A	0.038 (0.073)	0.032—0.045 (0.062-0.087)	0.10 (0.20)	0.092—0.12 (0.18--0.23)

ND- Not determined. NC- Not calculable.

* Nominal Values in lbs ae/A dicamba acid and lbs ae/A glyphosate acid are based on the proportions of dicamba acid (9.9%) and glyphosate acid (19.2%) in MON 76832

[1] Significant decrease in cabbage height, inhibition of 35, 63, and 68% at the 0.056, 0.17 and 0.51 lb ae/A Dicamba acid treatment levels, (0.11, 0.33, and 0.98 lb ae/A Glyphosate acid treatment levels), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[2] Significant decrease in carrot height, inhibition of 10, 48 and 68% at the 0.019, 0.056, 0.17 lb ae/A Dicamba acid treatment levels (0.037, 0.11 and 0.33 lb ae/A Glyphosate acid) , respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[3] Significant decrease in corn height, inhibition of 54 and 75% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[4] Significant decrease in lettuce height, inhibition of 22, 67, and 76% at the 0.019, 0.056, 0.17 lb ae/A dicamba acid treatment levels (0.037, 0.11 and 0.33 lb ae/A Glyphosate acid) , respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[5] Significant decrease in oilseed rape height, inhibition of 19 and 73% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid) , respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[6] Significant decrease in onion height, inhibition of 29 and 60% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[7] Significant decrease in ryegrass height, inhibition of 15, 54, 66, and 57% at the 0.056, 0.17, 0.51 and 1.5 lb ae/A dicamba acid treatment levels (0.11, 0.33, 0.98, and 2.9 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[8] Significant decrease in wheat height, inhibition of 6, 39, and 57% at the 0.019, 0.056, and 0.17 lb ae/A dicamba acid treatment levels (0.037, 0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

Table 5a: Reported Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for biomass in lbs ae/A Dicamba acid (lbs ae/A Glyphosate acid)*							
	weight (g)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	0.218-3.73	0.006 (0.012)	ND	N/A	0.011 (0.022)	0.0066—0.019 (0.013--0.036)	0.028 (0.055)	0.020—0.041 (0.038--0.079)
Carrot[2]	0.117-1.16	0.0021 (0.0040)	ND	N/A	0.012 (0.022)	0.0076—0.018 (0.015--0.034)	0.027 (0.053)	0.021—0.036 (0.040--0.069)

Species	Results summary for biomass in lbs ae/A Dicamba acid (lbs ae/A Glyphosate acid)*							
	weight (g)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Corn[3]	0.27-5.65	0.0062 (0.012)	ND	N/A	0.023 (0.044)	0.017—0.031 (0.032--0.059)	0.038 (0.074)	0.031—0.046 (0.061--0.089)
Lettuce[4]	0.103-2.38	0.0062 (0.012)	ND	N/A	0.0023 (0.0044)	0.00094—0.0055 (0.0018--0.011)	0.0073 (0.014)	0.0040—0.013 (0.0077--0.026)
Oilseed Rape[5]	0.19-4.17	0.00070 (0.0013)	ND	N/A	0.021 (0.040)	0.016—0.027 (0.031--0.052)	0.037 (0.072)	0.031—0.044 (0.061--0.086)
Onion[6]	0.0473-0.19	0.019 (0.037)	ND	N/A	0.022 (0.043)	0.0099—0.050 (0.019--0.10)	0.059 (0.11)	0.037—0.095 (0.071--0.18)
Ryegrass[7]	0.0767-1.01	0.019 (0.037)	ND	N/A	0.018 (0.034)	0.0084—0.037 (0.016--0.072)	0.049 (0.095)	0.029—0.082 (0.057--0.16)
Wheat[8]	0.08-1.47	0.019 (0.037)	ND	N/A	0.020 (0.039)	0.016—0.025 (0.031--0.049)	0.034 (0.066)	0.030—0.040 (0.057--0.077)

ND- Not determined. NC- Not calculable

* Nominal Values in lbs ae/A dicamba acid and lbs ae/A glyphosate acid are based on the proportions of dicamba acid (9.9%) and glyphosate acid (19.2%) in MON 76832

[1] Significant decrease in cabbage dry weight, inhibition of 18, 78, 93, and 94% at the 0.019, 0.056, 0.17, and 0.51 lb ae/A dicamba acid treatment levels (0.037, 0.11, 0.33, and 0.98 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[2] Significant decrease in carrot dry weight, inhibition of 18, 31, 83, and 90% at the 0.0062, 0.019, 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.012, 0.037, 0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[3] Significant decrease in corn dry weight, inhibition of 20, 75, and 95% at the 0.019, 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.037, 0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[4] Significant decrease in lettuce dry weight, inhibition of 35, 69, 91, and 95% at the 0.0062, 0.019, 0.056, and 0.17 lb ae/A dicamba acid treatment levels (0.012, 0.037, 0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[5] Significant decrease in oilseed rape dry weight, inhibition of 13, 12, 24, 72, and 95% at the 0.0021, 0.0062, 0.019, 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.0040, 0.012, 0.037, 0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[6] Significant decrease in onion dry weight, inhibition of 59 and 75% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[7] Significant decrease in ryegrass dry weight, inhibition of 46, 89, 92, and 92% at the 0.056, 0.17, 0.51, and 1.5 lb ae/A dicamba acid treatment levels (0.11, 0.33, 0.98, and 2.9 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

[8] Significant decrease in wheat dry weight, inhibition of 76 and 94% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).

Table 5b Reported Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor*

Species	Results summary for survival in lbs ae/A Dicamba acid (lbs ae/A Glyphosate acid)							
	%	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI
Cabbage[1]	27-100	0.056 (0.11)	ND	N/A	0.17 (0.34)	0.14—0.22 (0.27--0.42)	0.30 (0.59)	0.27—0.34 (0.52--0.67)
Carrot[2]	60-100	0.019 (0.037)	ND	N/A	0.11 (0.21)	0.09—0.13 (0.18--0.25)	>0.17 (>0.33)	N/A
Corn[3]	7-100	0.019 (0.037)	ND	N/A	0.058 (0.11)	0.048—0.070 (0.092--0.13)	0.080 (0.16)	0.070—0.092 (0.14--0.18)

Species	Results summary for survival in lbs ae/A Dicamba acid (lbs ae/A Glyphosate acid)							
	%	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI
Lettuce[4]	27-97	0.019 (0.037)	ND	N/A	0.057 (0.11)	0.040—0.082 (0.077--0.16)	0.10 (0.20)	0.083—0.13 (0.16--0.24)
Oilseed Rape[5]	50-100	0.056 (0.11)	ND	N/A	0.14 (0.27)	7.9E-136—2.5E133 (1.5E-135-4.8E+133)	0.17 (0.32)	0.16—0.17 (0.31-0.34)
Onion[6]	77-100	0.056 (0.11)	ND	N/A	>0.17 (>0.33)	N/A	>0.17 (>0.33)	N/A
Ryegrass[7]	7-100	0.056 (0.11)	ND	N/A	0.14 (0.27)	0.095—0.21 (0.18-0.40)	0.30 (0.57)	0.23—0.38 (0.44-0.74)
Wheat[8]	10-100	0.056 (0.11)	ND	N/A	0.077 (0.15)	0.056—0.11 (0.11--0.21)	0.11 (0.20)	0.081—0.13 (0.16--0.24)

ND- Not determined. NC- Not calculable.
* Nominal Values in lbs ae/A dicamba acid and lbs ae/A glyphosate acid are based on the proportions of dicamba acid (9.9%) and glyphosate acid (19.2%) in MON 76832
[1] Significant decrease in cabbage survival, inhibition of 23 and 73% at the 0.17 and 0.51 lb ae/A dicamba acid treatment levels (0.33 and 0.98 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).
[2] Significant decrease in carrot survival, inhibition of 10 and 40% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).
[3] Significant decrease in corn survival, inhibition of 23 and 93% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).
[4] Significant decrease in lettuce survival, inhibition of 28 and 72% at the 0.056 and 0.17 lb ae/A dicamba acid treatment levels (0.11 and 0.33 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).
[5] Significant decrease in oilseed rape survival, inhibition of 50% at the 0.17 lb ae/A dicamba acid treatment level (0.33 lb ae/A Glyphosate acid) compared to the negative control (Dunnett's test, $p<0.05$).
[6] Significant decrease in onion survival, inhibition of 23% at the 0.17 lb ae/A dicamba acid treatment level (0.33 lb ae/A Glyphosate acid) compared to the negative control (Dunnett's test, $p<0.05$).
[7] Significant decrease in ryegrass survival, inhibition of 33, 67, and 93% at the 0.17, 0.51 and 1.5 lb ae/A dicamba acid treatment levels (0.33, 0.98, and 2.9 lb ae/A Glyphosate acid), respectively, compared to the negative control (Dunnett's test, $p<0.05$).
[8] Significant decrease in wheat survival, inhibition of 90% at the 0.17 lb ae/A dicamba acid treatment level (0.33 lb ae/A Glyphosate acid) compared to the negative control (Dunnett's test, $p<0.05$).

Plant Injury Index*									
Control Plants (all)	Treated Cabbage	Treated Carrot	Treated Corn	Treated Lettuce	Treated Oilseed Rape	Treated Onion	Treated Ryegrass	Treated Wheat	Formulation Blank
0-20	0-96	0-78	0-100	0-98	0-98	0-84	0-100	0-100	N/A

*0 = no effect; 10-30 = slight effect; 40-60 = moderate effect; 70-90 = severe effect; 100 = complete effect/death of entire plant.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

All analyses were conducted comparing treated to the negative control. These analyses were conducted using CETIS version 1.8.7.12 and backend settings approved for use by EFED on 10/20/2015. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied these assumptions were subjected to

Dunnett's and William's tests, and data that did not satisfy these assumptions were subjected to the non-parametric Mann-Whitney U and Jonckheere's tests. Measured concentrations were used in the analyses for all treatment levels. Linear (survival) and nonlinear (height and dry weight) regression models were used to interpret EC/ICx values.

The reviewer found the same significant inhibitions in survival as the study author. Significant survival inhibitions in carrot were 10 and 40%, and in lettuce were 28 and 72% at the 0.055/0.057, and 0.16/0.17 lb ae/A measured Dicamba acid treatment levels, respectively (0.11/0.13 and 0.32/0.33 lb ae/A measured Glyphosate acid treatment levels (Jonckheere-Terpstra Step-Down test for carrot and lettuce, $p<0.05$); significant survival inhibitions in ryegrass were 33, 67, and 93% at 0.16, 0.49, and 1.4 lb ae/A measured Dicamba acid concentrations, respectively (0.33, 1.0, and 3.3 lb ae/A measured Glyphosate acid, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$). Significant decreases in corn survival of 23 and 93% were found at 0.055 and 0.16 lb ae/A measured dicamba acid concentrations, respectively (0.11 and 0.33 lb ae/A measured Glyphosate acid), and significant decreases in cabbage survival of 23 and 73% were found at 0.17 and 0.5 lb ae/A, respectively, measured Dicamba acid concentrations (0.32 and 0.97 lb ae/A measured Glyphosate acid;Mann-Whitney U Two-Sample test, $p<0.05$). In addition, significant inhibitions in oilseed rape, onion, and wheat survival were 50, 23 and 90% at 0.16/0.17 lb ae/A measured dicamba acid (0.32/0.33 lb ae/A measured Glyphosate acid), respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

The reviewer found the same significant inhibitions in height as the study author, but based their statistical results on measured concentrations. Significant inhibitions in carrot height were 10, 48 and 68%, in lettuce height were 22, 67, and 76%, and in wheat height were 6, 39, and 57% at measured dicamba concentrations of 0.018/0.019, 0.055/0.057, and 0.16/0.17 lb ae/A, respectively (0.035, 0.11 and 0.32/0.33 lb ae/A measured Glyphosate acid, respectively), compared to the negative control (Williams test, $p<0.05$). Significant inhibitions in corn height were 54 and 75%, and in oilseed rape height were 19 and 74%, at 0.055/0.057 and 0.16/0.17 measured dicamba acid concentrations, respectively (0.11 and 0.32/0.33 lb ae/A measured Glyphosate acid, respectively; Williams test, $p<0.05$). Significant inhibition in cabbage height was 35, 63, and 68% at 0.057, 0.17 and 0.50 lb ae/A measured dicamba acid concentrations, respectively (0.11, 0.32, and 0.97 lb ae/A measured Glyphosate acid, respectively; Williams test, $p<0.05$). In addition, significant decreases in onion height of 29 and 60% were found at 0.055 and 0.16 lb ae/A measured dicamba acid concentrations, respectively 0.11 and 0.33 lb ae/A measured Glyphosate acid, respectively, and significant decreases in ryegrass height of 15, 54, 66, and 57% were found at 0.055, 0.16, 0.49 and 1.44 lb ae/A measured dicamba acid, respectively (0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid, respectively), compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

The reviewer also found significant inhibitions in seedling dry weight in all species tested compared to the negative control. Significant inhibitions in corn dry weight were 20, 75, and 95% at 0.035, 0.11 and 0.33 lb ae/A Glyphosate acid, respectively; significant inhibitions in onion dry weight were 59 and 75%, and in wheat dry weight were 76 and 94%, at 0.11 and 0.33 lb ae/A Glyphosate acid, respectively (Williams test, $p<0.05$). For oilseed rape dry weight, significant inhibitions were 13, 12, 24, 72, and 95%, at the 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A measured dicamba acid concentrations, respectively (0.0037, 0.012, 0.035, 0.11 and 0.32 lb ae/A measured Glyphosate acid, respectively; Jonckheere-Terpstra Step-Down test, $p<0.05$). Significant decreases in carrot dry weight were 18, 31, 83, and 90% at 0.0064, 0.019, 0.057 and 0.17 lb ae/A measured dicamba acid concentrations, respectively (0.012, 0.035, 0.11 and 0.32 lb ae/A measured Glyphosate acid, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$. In cabbage dry weight significant inhibitions were 18, 78, 93, and 94% at 0.019, 0.057, 0.17 and 0.50 lb ae/A measured dicamba acid concentrations, respectively (0.035, 0.11, 0.32, and 0.97 lb ae/A measured Glyphosate acid; and in ryegrass dry weight were 46, 88, 92, and 92% at 0.055, 0.16, 0.49 and 1.4 lb ae/A measured dicamba acid concentrations, respectively (0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid, respectively), compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$). For lettuce dry weight, significant inhibitions were 19, 35, 69, 91, and 95% at the 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A measured dicamba concentrations,

respectively (0.012, 0.035, 0.11 and 0.32 lb ae/A measured glyphosate), compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

The reviewer and study author statistical analyses were similar for all species and endpoints, except for lettuce dry weight, where the reviewer found a significant inhibition of 19% at the 0.0021 lb ae/A dicamba acid treatment ($p=0.027$), while the study author was only able to detect a statistical difference relative to the controls at the next highest treatment level (observed mean 35% inhibition at the 0.0064 lb ae/A dicamba acid treatment level). This difference is likely due to the study author's use of Dunnett's test to evaluate statistical significance, while the reviewer observed that the data generally followed a monotonic trend and used the non-parametric Jonckheere-Terpstra Step-Down Test.

Table 6: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for height (lbs ae/A Dicamba acid)							
	height (cm)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	8.25-27.6	0.019	0.00851	0.0027- 0.014	0.0413	0.0301- 0.0545	0.124	0.1-0.152
Carrot[2]	11.4-35.5	0.0064	0.00895	0.0047- 0.0127	0.0325	0.0261- 0.0395	0.0794	0.0683- 0.0923
Corn[3]	28-113	0.018	0.0139	0.00478- 0.0188	0.032	0.0259- 0.0382	0.0569	0.0495- 0.0656
Lettuce[4]	6.5-29.2	0.0064	0.00526	0.00132-0.00816	0.0181	0.0132- 0.0237	0.0429	0.0349- 0.0528
Oilseed Rape[5]	9.88-38.2	0.019	0.0317	0.0182- 0.04	0.0649	0.0547- 0.0753	0.107	0.095- 0.12
Onion[6]	11.5-28.9	0.018	0.0163	0.00291- 0.0252	0.053	0.0398- 0.0679	0.12	0.0977- 0.148
Ryegrass[7]	10.8-33.1	0.018	0.00942	N/A- 0.0198	0.0574	0.0366- 0.0846	0.202	0.149- 0.274
Wheat[8]	24.5-57.1	0.0060	0.01	0.00712- 0.0127	0.0377	0.0333- 0.0424	0.0947	0.0831- 0.108

ND- Not determined. NC- Not calculable.

[1] Significant decrease in cabbage height, inhibition of 35, 63, and 68% at the 0.057, 0.17, and 0.50 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[2] Significant decrease in carrot height, inhibition of 10, 48 and 68% at the 0.019, 0.057, and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[3] Significant decrease in corn height, inhibition of 54 and 75% at the 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[4] Significant decrease in lettuce height, inhibition of 22, 67, and 76% at the 0.019, 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[5] Significant decrease in oilseed rape height, inhibition of 19 and 74% at the 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[6] Significant decrease in onion height, inhibition of 29 and 60% at the 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[7] Significant decrease in ryegrass height, inhibition of 15, 54, 66, and 57% at the 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).
[8] Significant decrease in wheat height, inhibition of 6, 39, and 57% at the 0.018, 0.055, and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

Table 6a: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for biomass (lbs ae/A Dicamba acid)							
	Weight (g)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	0.218-3.73	0.0064	0.0108	0.00652- 0.0134	0.0211	0.0181- 0.0242	0.0337	0.0302- 0.0377
Carrot[2]	0.117-1.16	0.0021	0.00649	N/A- 0.00944	0.016	0.0119- 0.0203	0.0298	0.0246-0.036
Corn[3]	0.27-5.65	0.0060	0.0133	N/A- 0.0185	0.0246	0.0173- 0.0317	0.0378	0.0309- 0.0463
Lettuce[4]	0.103-2.38	0.00023[4]	0.000392	N/A- 0.00112	0.00223	0.000986- 0.00412	0.00744	0.00453- 0.0122
Oilseed Rape[5]	0.19-4.17	0.00068	0.0101	0.00435- 0.0133	0.0221	0.018- 0.0264	0.0382	0.0333- 0.0439
Onion[6]	0.0473-0.19	0.018	0.00705	N/A- 0.0152	0.0244	0.0115- 0.0414	0.0578	0.0376- 0.0887
Ryegrass[7]	0.0767-1.01	0.018	0.0128	N/A- 0.0194	0.0311	0.0224- 0.0404	0.0575	0.047- 0.0705
Wheat[8]	0.08-1.47	0.018	0.0118	N/A- 0.0151	0.0221	0.0179- 0.0263	0.0342	0.0297- 0.0394

ND- Not determined. NC- Not calculable.
[1] Significant decrease in cabbage dry weight, inhibition of 18, 78, 93, and 94% at the 0.019, 0.057, 0.17, and 0.50 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).
[2] Significant decrease in carrot dry weight, inhibition of 18, 31, 83, and 90% at the 0.0064, 0.019, 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).
[3] Significant decrease in corn dry weight, inhibition of 20, 75, and 95% at the 0.018, 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).
[4] Significant decrease in lettuce dry weight, inhibition of 19, 35, 69, 91, and 95% at the 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$). Although, the 20% inhibition observed at the 0.00068 lb ae/A treatment group was not determined to be statistically different than controls (Jonckheere-Terpstra Step-Down test, $p=0.12$), the reviewer determined that it would not be appropriate to set this level as the NOAEC and therefore the NOAEC was determined to be the 0.00023 lb ae/A treatment group. See Reviewer Comments for additional details.
[5] Significant decrease in oilseed rape dry weight, inhibition of 13, 12, 24, 72, and 95% at the 0.0021, 0.0064, 0.019, 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).
[6] Significant decrease in onion dry weight, inhibition of 59 and 75% at the 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).
[7] Significant decrease in ryegrass dry weight, inhibition of 46, 88, 92, and 92% at the 0.055, 0.16, 0.49, and 1.4 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).
[8] Significant decrease in wheat dry weight, inhibition of 76 and 94% at the 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

Table 6b: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for survival (lbs ae/A Dicamba acid)									
	%	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	95%CI
Cabbage[1]	27-100	0.057	0.0946	0.0476-0.135	0.19	0.133-0.243	0.309	0.241-0.413	3.2	2.02-4.39
Carrot[2]	60-100	0.019	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Corn[3]	7-100	0.018	0.0358	0.022-0.0466	0.0568	0.0427-0.0689	0.0781	0.0638-0.0959	4.86	3.12-6.6
Lettuce[4]	27-97	0.019	0.000688	9.88E-05-0.00192	0.017	0.00818-0.0358	0.157	0.0668-0.72	0.697	0.449-0.946
Oilseed Rape[5]	50-100	0.057	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Onion[6]	77-100	0.055	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Ryegrass[7]	7-100	0.055	0.0643	0.0335-0.0968	0.162	0.11-0.215	0.307	0.232-0.409	2.43	1.76-3.09
Wheat[8]	10-100	0.055	0.0521	0.0354-0.0652	0.0755	0.059-0.0903	0.0978	0.081-0.118	6	4.02-7.98

ND- Not determined. NC- Not calculable.

[1] Significant decrease in cabbage survival, inhibition of 23 and 73% at the 0.17 and 0.50 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[2] Significant decrease in carrot survival, inhibition of 10 and 40% at the 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[3] Significant decrease in corn survival, inhibition of 23 and 93% at the 0.055 and 0.16 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[4] Significant decrease in lettuce survival, inhibition of 28 and 72% at the 0.057 and 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[5] Significant decrease in oilseed rape survival, inhibition of 50% at the 0.17 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[6] Significant decrease in onion survival, inhibition of 23% at the 0.16 lb ae/A Dicamba acid treatment level compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[7] Significant decrease in ryegrass survival, inhibition of 33, 67, and 93% at the 0.16, 0.49, and 1.4 lb ae/A Dicamba acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[8] Significant decrease in wheat survival, inhibition of 90% at the 0.16 lb ae/A Dicamba acid treatment level compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

Table 6c: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for height (lbs ae/A Glyphosate acid)							
	height (cm)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	8.25-27.6	0.035	0.0158	0.00499- 0.0262	0.0777	0.0567-0.103	0.235	0.19- 0.29
Carrot[2]	11.4-35.5	0.012	0.017	0.00903- 0.0241	0.0617	0.0496- 0.075	0.151	0.13- 0.175
Corn[3]	28-113	0.035	0.0269	0.0092- 0.0366	0.063	0.0509-0.0757	0.114	0.0986- 0.132
Lettuce[4]	6.5-29.2	0.012	0.00973	0.00257- 0.0151	0.034	0.0248- 0.0446	0.0813	0.066- 0.1
Oilseed Rape[5]	9.88-38.2	0.035	0.0623	0.0358- 0.0782	0.125	0.106- 0.145	0.204	0.181- 0.228
Onion[6]	11.5-28.9	0.035	0.0314	0.00581- 0.049	0.106	0.0788- 0.136	0.246	0.199- 0.305
Ryegrass[7]	10.8-33.1	0.035	0.0182	N/A- 0.039	0.114	0.0721- 0.17	0.411	0.3- 0.562
Wheat[8]	24.5-57.1	0.012	0.0192	0.0136- 0.0246	0.0747	0.0658- 0.0843	0.192	0.168- 0.22

ND- Not determined. NC- Not calculable.

[1] Significant decrease in cabbage height, inhibition of 35, 63, and 68% at the 0.11, 0.32, and 0.97 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[2] Significant decrease in carrot height, inhibition of 10, 48 and 68% at the 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[3] Significant decrease in corn height, inhibition of 54 and 75% at the 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[4] Significant decrease in lettuce height, inhibition of 22, 67, and 76% at the 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[5] Significant decrease in oilseed rape height, inhibition of 19 and 74% at the 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[6] Significant decrease in onion height, inhibition of 29 and 60% at the 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[7] Significant decrease in ryegrass height, inhibition of 15, 54, 66, and 57% at the 0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[8] Significant decrease in wheat height, inhibition of 6, 39, and 57% at the 0.035, 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

Table 6d: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for biomass (lbs ae/A Glyphosate acid)							
	Weight (g)	NOAEC	IC_{05}	95%CI	IC_{25}	95%CI	IC_{50}	95%CI
Cabbage[1]	0.218-3.73	0.012	0.0193	0.0116- 0.0241	0.039	0.0332- 0.0449	0.0637	0.0568- 0.0714
Carrot[2]	0.117-1.16	0.0037	0.0113	N/A- 0.0166	0.029	0.0216- 0.037	0.0558	0.0459- 0.0678
Corn[3]	0.27-5.65	0.012	0.0256	N/A- 0.036	0.0482	0.0336- 0.0625	0.0749	0.0609- 0.0922
Lettuce[4]	0.103-2.38	0.00042[4]	0.00068	N/A- 0.00198	0.00398	0.00176- 0.00739	0.0136	0.00823- 0.0225
Oilseed Rape[5]	0.19-4.17	0.0013	0.0181	0.00805- 0.024	0.041	0.0331- 0.0492	0.0723	0.0627- 0.0834
Onion[6]	0.0473-0.19	0.035	0.0133	N/A- 0.0291	0.0476	0.0222- 0.0816	0.116	0.0745- 0.179
Ryegrass[7]	0.0767-1.01	0.035	0.0246	N/A- 0.0375	0.0612	0.0438- 0.0801	0.115	0.0936- 0.142
Wheat[8]	0.08-1.47	0.035	0.0228	N/A- 0.0292	0.0432	0.0349- 0.0515	0.0675	0.0584- 0.0781

ND- Not determined. NC- Not calculable.

[1] Significant decrease in cabbage dry weight, inhibition of 18, 78, 93, and 94% at the 0.035, 0.11, 0.32, and 0.97 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[2] Significant decrease in carrot dry weight, inhibition of 18, 31, 83, and 90% at the 0.012, 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[3] Significant decrease in corn dry weight, inhibition of 20, 75, and 95% at the 0.035, 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[4] Significant decrease in lettuce dry weight, inhibition of 19, 35, 69, 91, and 95% at the 0.0037, 0.012, 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$). Although, the 20% inhibition observed at the 0.0013 lb ae/A treatment group was not determined to be statistically different than controls (Jonckheere-Terpstra Step-Down test, $p=0.12$), the reviewer determined that it would not be appropriate to set this level as the NOAEC and therefore the NOAEC was determined to be the 0.00042 lb ae/A treatment group. See Reviewer Comments section for additional details.

[5] Significant decrease in oilseed rape dry weight, inhibition of 13, 12, 24, 72, and 95% at the 0.0037, 0.012, 0.035, 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[6] Significant decrease in onion dry weight, inhibition of 59 and 75% at the 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

[7] Significant decrease in ryegrass dry weight, inhibition of 46, 88, 92, and 92% at the 0.11, 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[8] Significant decrease in wheat dry weight, inhibition of 76 and 94% at the 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Williams test, $p<0.05$).

Table 7b: Reviewer Determined Effect of Dicamba DGA+ Glyphosate Ethanolamine Salt on 21-Day Vegetative Vigor

Species	Results summary for survival (lbs ae/A Glyphosate acid)									
	%	NOAEC	EC_{05}	95%CI	EC_{25}	95%CI	EC_{50}	95%CI	slope	95%CI
Cabbage[1]	27-100	0.11	0.177	0.0898-0.253	0.361	0.253-0.464	0.592	0.46-0.798	3.14	2-4.29
Carrot[2]	60-100	0.035	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Corn[3]	7-100	0.035	0.0708	0.0429-0.0927	0.114	0.0848-0.139	0.158	0.128-0.195	4.73	3.04-6.42
Lettuce[4]	27-97	0.035	0.00126	0.00018-0.00354	0.0317	0.0152-0.0672	0.298	0.126-1.37	0.693	0.447-0.94
Oilseed Rape[5]	50-100	0.11	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Onion[6]	77-100	0.11	NC	N/A	NC	N/A	NC	N/A	N/A	N/A
Ryegrass[7]	7-100	0.11	0.127	0.0645-0.193	0.33	0.223-0.443	0.641	0.48-0.867	2.33	1.69-2.97
Wheat[8]	10-100	0.11	0.104	0.0699-0.131	0.152	0.118-0.183	0.199	0.164-0.24	N/A	N/A

ND- Not determined. NC- Not calculable.

[1] Significant decrease in cabbage survival, inhibition of 23 and 73% at the 0.32 and 0.97 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[2] Significant decrease in carrot survival, inhibition of 10 and 40% at the 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[3] Significant decrease in corn survival, inhibition of 23 and 93% at the 0.11 and 0.33 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[4] Significant decrease in lettuce survival, inhibition of 28 and 72% at the 0.11 and 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[5] Significant decrease in oilseed rape survival, inhibition of 50% at the 0.32 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[6] Significant decrease in onion survival, inhibition of 23% at the 0.33 lb ae/A Glyphosate acid treatment level compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

[7] Significant decrease in ryegrass survival, inhibition of 33, 67, and 93% at the 0.33, 1.0, and 3.3 lb ae/A Glyphosate acid treatment levels, respectively, compared to the negative control (Jonckheere-Terpstra Step-Down test, $p<0.05$).

[8] Significant decrease in wheat survival, inhibition of 90% at the 0.33 lb ae/A Glyphosate acid treatment level compared to the negative control (Mann-Whitney U Two-Sample test, $p<0.05$).

Plant Injury Index*									
Control Plants (all)	Treated Cabbage	Treated Carrot	Treated Corn	Treated Lettuce	Treated Oilseed Rape	Treated Onion	Treated Ryegrass	Treated Wheat	Formulation Blank
0-20	0-96	0-78	0-100	0-98	0-98	0-84	0-100	0-100	N/A

*0 = no effect; 10-30 = slight effect; 40-60 = moderate effect; 70-90 = severe effect; 100 = complete effect/death of entire plant.

Dicamba Acid (based on measured concentrations)

Monocot

Most sensitive monocot: Wheat, based on dry weight

EC_{50}/IC_{50}: 0.0342 lb ae/A 95% C.I.: 0.0297-0.0394 lb ae/A
EC_{25}/IC_{25}: 0.0221 lb ae/A 95% C.I.: 0.0179-0.0263 lb ae/A
EC_{05}/IC_{05}: 0.0118 lb ae/A 95% C.I.: N/A-0.0151 lb ae/A
NOAEC: 0.018 lb ae/A

Dicot

Most sensitive dicot: Lettuce, based on dry weight

EC_{50}/IC_{50}: 0.00744 lb ae/A 95% C.I.: 0.00453-0.0122 lb ae/A
EC_{25}/IC_{25}: 0.00223 lb ae/A 95% C.I.: 0.000986-0.00412 lb ae/A
EC_{05}/IC_{05}: 0.000392 lb ae/A 95% C.I.: N/A-0.00112 lb ae/A
NOAEC: 0.00023 lb ae/A

Glyphosate Acid

Monocot

Most sensitive monocot: Wheat, based on dry weight

EC_{50}/IC_{50}: 0.0675 lb ae/A 95% C.I.: 0.0584-0.0781 lb ae/A
EC_{25}/IC_{25}: 0.0432 lb ae/A 95% C.I.: 0.0349-0.0515 lb ae/A
EC_{05}/IC_{05}: 0.0228 lb ae/A 95% C.I.: N/A-0.0292 lb ae/A
NOAEC: 0.035 lb ae/A

Dicot

Most sensitive dicot: Lettuce, based on dry weight

EC_{50}/IC_{50}: 0.0136 lb ae/A 95% C.I.: 0.00823-0.0225 lb ae/A
EC_{25}/IC_{25}: 0.00398 lb ae/A 95% C.I.: 0.00176-0.00739 lb ae/A
EC_{05}/IC_{05}: 0.00068 lb ae/A 95% C.I.: N/A-0.00198 lb ae/A
NOAEC: 0.00042 lb ae/A

D. STUDY DEFICIENCIES:

1. Four dicots were included in this study. EPA guidance recommends testing six dicots. An earlier study, MRID 49953901, completed June 22, 2016, included two additional dicots.

2. CEC and percent moisture were not reported.

3. The physico-chemical properties of the test material were not reported.

E. REVIEWER'S COMMENTS:

The reviewer and study author results were similar for most species, but the reviewer found a different monocot to be the most sensitive monocot species, arrived at different listed species endpoints for the most sensitive species (for both monocots and dicots) and also used measured concentrations to determine dicamba and glyphosate endpoints while the study author used nominal concentrations. The study author determined the most sensitive monocot was ryegrass, based on dry weight, with NOER and ER_{25} values of 0.19 and 0.20 lb/A nominal MON 76832 formulation, respectively (0.019 and 0.017 lb ae/A nominal dicamba acid and 0.037 and 0.034 lb ae/A nominal Glyphosate acid, respectively) and the most sensitive dicot was lettuce, based on dry weight, with NOER and ER_{25} values of 0.021 and 0.023 lb/A nominal MON 76832 concentrations, respectively (0.0021 and 0.0022 lb ae/A nominal dicamba acid and 0.0040 and 0.0044 lb ae/A nominal Glyphosate acid, respectively).

In contrast, the reviewer found the most sensitive monocot species to be wheat with NOAEC, IC_{05} and IC_{25} endpoint values to be 0.192, 0.117 and 0.202 lb/A, nominal MON 76832 formulation, respectively (0.018, 0.0118 and 0.0221 lb ae/A in terms of measured dicamba acid concentrations and in terms of glyphosate acid measured concentrations to be 0.035, 0.0228 and 0.0432 lb ae/A), while the reviewer determined endpoints for ryegrass were less sensitive (IC_{25}s of 0.031 lb and 0.061 ae/A measured dicamba acid and glyphosate acid, respectively). However, as the wheat NOAEC and IC_{25} endpoints are essentially indistinguishable, the reviewer finds that the regression-based IC_{05} would be more appropriate for quantitative use in risk assessment and be more likely to be protective of risks to listed species, rather than the NOAEC. Using the same rationale, the reviewer reached similar conclusions regarding the use of the IC_{05} in place of the NOAEC for the less sensitive onion dry weight endpoint.

For dicots, the reviewer agreed with the study author that the most sensitive dicot was lettuce. Based on the dry weight endpoint, the reviewer determined statistical NOAEC, IC_{05} and IC_{25} values in terms of Dicamba acid of 0.00068, 0.000392 and 0.00223 lb ae/A, respectively, and in terms of Glyphosate acid of 0.0037, 0.00068 and 0.00398 lb ae/A, respectively. The reviewer-determined statistical NOAEC was below the study author reported NOAEC of 0.0021 lb ae/A dicamba acid (0.0040 lb ae/A glyphosate acid) as a result of the study author's use of Dunnett's test to determine significance, while the reviewer used the non-parametric Jonckheere-Terpstra Step-Down test due to the heterogeneous variances and the generally monotonic trend in the data. Additionally, the reviewer observed that although the next lowest dose (0.00068 lb ae/A dicamba acid and 0.0013 lb ae/A glyphosate acid) was not determined to be statistically significantly different from controls ($p=0.12$), the mean inhibition of 20% at this concentration was essentially identical to the statistically significant 19% difference detected in the 0.0021 lb ae/A dicamba acid treatment group, although the variability was slightly higher in the lower treatment group (CVs of 38.3% and 34.8%, respectively, for the 0.00068 and 0.0021 lb ae/A dicamba acid treatment groups). Therefore, the reviewer determined that for risk assessment purposes, the NOAEC should be established at the lowest treatment concentration of 0.00023 lb ae/A dicamba acid (0.00042 lb ae/A glyphosate acid) to account for potential effects to listed species. It is noted that as the effect at the established NOAEC was actually an increase of 25.6% biomass relative to controls (not unusual for low doses of growth-regulating herbicides affecting the auxin mechanism of action), that any potential adverse effects on dry weight

compared to controls would be much more likely to occur closer to the LOAEC of 0.00068 lb ae/A than to the established NOAEC.

This study included two active ingredients Dicamba and Glyphosate acid, and the study author analytically confirmed the concentrations of both these active ingredients in the test solutions. The reviewer used these measured concentrations in their analyses.

The reviewer's results are presented in the Executive Summary and Conclusions sections of this DER.

The in-life portion of this study was initiated on September 14, 2016 and completed on October 12, 2016.

F. CONCLUSIONS:

This study is scientifically sound] and combined with the data from MRID 49953901 is classified as **acceptable**. The most sensitive monocot was wheat, based on dry weight, with IC_{05} and IC_{25} values in terms of measured Dicamba acid concentrations of 0.0118 and 0.0221 lb ae/A, and in terms of measured Glyphosate acid concentrations of 0.0228 and 0.0432 lb ae/A, respectively; the most sensitive dicot was lettuce, based on dry weight, with NOAEC and IC_{25} values in terms of measured Dicamba acid of 0.00023 and 0.00223 lb ae/A, respectively, and in terms of Glyphosate acid of 0.00042 and 0.00398 lb ae/A, respectively.

Dicamba Acid
Most sensitive monocot and EC_{25}/IC_{25}: Wheat (dry weight, 0.0221 lb ae/A Dicamba acid)
Most sensitive dicot and EC_{25}/IC_{25}: Lettuce (dry weight; 0.00223 lb ae/A Dicamba acid)

Glyphosate Acid
Most sensitive monocot and EC_{25}/IC_{25}: Wheat (dry weight, 0.0432 lb ae/A Glyphosate acid)
Most sensitive dicot and EC_{25}/IC_{25}: Lettuce (dry weight; 0.00398 lb ae/A Glyphosate acid)

Total formulation MON 76832
Most sensitive monocot and EC_{25}/IC_{25}: Wheat (dry weight, 0.22 lb Total Formulation/A)
Most sensitive dicot and EC_{25}/IC_{25}: Lettuce (dry weight; 0.021 lb Total Formulation/A)

III. REFERENCES:

1. U.S. Environmental Protection Agency. 2012. Series 850- Ecological Effects Test Guidelines, OCSPP Number 850.4150: Vegetative Vigor.

2. Frans, Robert E. and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

3. SAS Institute, Inc. 2002-2012. SAS Proprietary Software Version 9.4, Cary, NC.

4. Bruce, Robert D. and Donald J. Versteeg. 1992. A Statistical Procedure for Modeling Continuous Toxicity Data. Environmental Toxicology and Chemistry. 11: 1485-1494.

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	05-6459-6252	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	11 Feb-17 18:32	**Species:**	Brassica oleracea	**Brine:**	
Duration:	150d 19h	**Source:**	Sustainable Seed Co., CA	**Age:**	
Sample ID:	16-5652-4096	**Code:**	50103801 d-cabb	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	11 Feb-17 18:32	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - Dicamba acid measured test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-0657-6532	Height	0.019	0.057	0.03291	9.59%		Dunnett Multiple Comparison Test
05-5215-4777	Height	0.019	0.057	0.03291	7.31%		Williams Multiple Comparison Test
02-1100-8537	Survival	0.057	0.17	0.09844	8.78%		Mann-Whitney U Two-Sample Test
08-9467-8762	Weight	0.0064	0.019	0.01103	NA		Jonckheere-Terpstra Step-Down Test
02-5266-6343	Weight	0.0064	0.019	0.01103	8.28%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
16-3859-1806	Height	IC5	0.00851	0.0027	0.014		Nonlinear Regression
		IC10	0.0154	0.00881	0.0225		
		IC25	0.0413	0.0301	0.0545		
		IC50	0.124	0.1	0.152		
17-9312-2161	Survival	EC5	0.0946	0.0476	0.135		Linear Regression (MLE)
		EC10	0.123	0.0707	0.166		
		EC25	0.19	0.133	0.243		
		EC50	0.309	0.241	0.413		
08-0234-4901	Survival	EC50	0.302	0.237	0.385		Trimmed Spearman-Kärber
13-3587-0514	Weight	IC5	0.0108	0.00652	0.0134		Nonlinear Regression
		IC10	0.0139	0.0106	0.0166		
		IC25	0.0211	0.0181	0.0242		
		IC50	0.0337	0.0302	0.0377		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	26.1	25.1	27	24.6	27.4	0.371	0.909	3.49%	0.0%
0.0021		6	27.3	26	28.6	25.8	29	0.497	1.22	4.46%	-4.73%
0.0064		6	27.2	25.2	29.3	24	29.2	0.792	1.94	7.13%	-4.48%
0.019		6	27.6	24.7	30.5	24	32	1.13	2.77	10.0%	-5.75%
0.057		6	16.9	14.8	18.9	14.8	19.4	0.806	1.97	11.7%	35.3%
0.17		6	9.65	8.14	11.2	8.3	11.7	0.589	1.44	15.0%	63.0%
0.5		6	8.25	6.32	10.2	6	11	0.75	1.84	22.3%	68.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0021		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0064		6	1	1	1	1	1	0	0	0.0%	0.0%
0.019		6	1	1	1	1	1	0	0	0.0%	0.0%
0.057		6	1	1	1	1	1	0	0	0.0%	0.0%
0.17		6	0.767	0.56	0.973	0.6	1	0.0803	0.197	25.6%	23.3%
0.5		6	0.267	0.158	0.375	0.2	0.4	0.0422	0.103	38.7%	73.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	3.54	3.11	3.96	2.86	3.97	0.165	0.404	11.4%	0.0%
0.0021		6	3.73	3.37	4.09	3.12	4.08	0.14	0.343	9.19%	-5.47%
0.0064		6	3.58	3.19	3.96	2.98	4.13	0.15	0.368	10.3%	-1.13%
0.019		6	2.91	2.58	3.24	2.44	3.35	0.129	0.316	10.9%	17.7%
0.057		6	0.777	0.612	0.941	0.58	0.96	0.064	0.157	20.2%	78.0%
0.17		6	0.238	0.149	0.327	0.15	0.38	0.0347	0.085	35.6%	93.3%
0.5		6	0.218	0.198	0.239	0.2	0.25	0.00792	0.0194	8.89%	93.8%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	27.4	24.6	25.8	26	26.4	26.2
0.0021		28	25.8	29	26	27.4	27.6
0.0064		26.2	24	27	28.8	28.2	29.2
0.019		28	24	29	26.2	26.2	32
0.057		16	19	17	19.4	14.8	15
0.17		8.8	8.3	11.7	11	8.3	9.8
0.5		6.5	9	8	6	11	9

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0021		1	1	1	1	1	1
0.0064		1	1	1	1	1	1
0.019		1	1	1	1	1	1
0.057		1	1	1	1	1	1
0.17		1	0.8	0.6	0.6	0.6	1
0.5		0.4	0.2	0.2	0.4	0.2	0.2

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	3.79	2.86	3.97	3.3	3.54	3.76
0.0021		3.69	3.7	3.76	4.08	4.03	3.12
0.0064		3.62	3.65	4.13	2.98	3.5	3.58
0.019		2.75	3.35	2.91	3.15	2.44	2.87
0.057		0.68	0.96	0.66	0.92	0.86	0.58
0.17		0.15	0.22	0.38	0.28	0.16	0.24
0.5		0.2	0.25	0.2	0.23	0.21	0.22

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) — **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	15-0581-5469	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	10 Feb-17 19:50	**Species:**	Daucus carota	**Brine:**	
Duration:	149d 20h	**Source:**	Meyer Seed Co., Baltimore, MD	**Age:**	
Sample ID:	09-3767-6637	**Code:**	50103801 d-carr	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	10 Feb-17 19:50	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Dicamba test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-5447-3138	Height	0.0064	0.019	0.01103	9.17%		Dunnett Multiple Comparison Test
07-7435-9757	Height	0.0064	0.019	0.01103	6.99%		Williams Multiple Comparison Test
16-3138-8993	Survival	0.019	0.057	0.03291	NA		Jonckheere-Terpstra Step-Down Test
17-3439-1862	Survival	0.057	0.17	0.09844	6.3%		Mann-Whitney U Two-Sample Test
02-1299-8045	Weight	0.0021	0.0064	0.003666	NA		Jonckheere-Terpstra Step-Down Test
18-6811-5539	Weight	0.0021	0.0064	0.003666	11.0%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
08-2195-9672	Height	IC5	0.00895	0.0047	0.0127		Nonlinear Regression
		IC10	0.0145	0.00983	0.0192		
		IC25	0.0325	0.0261	0.0395		
		IC50	0.0794	0.0683	0.0923		
16-6538-0398	Survival	EC5	0.013	N/A	N/A		Linear Regression (MLE)
		EC10	0.0298	N/A	N/A		
		EC25	0.118	N/A	N/A		
		EC50	0.548	N/A	N/A		
03-0737-9443	Weight	IC5	0.00649	N/A	0.00944		Nonlinear Regression
		IC10	0.00909	0.00501	0.0124		
		IC25	0.016	0.0119	0.0203		
		IC50	0.0298	0.0246	0.036		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	35.5	33.6	37.4	33.2	37.6	0.739	1.81	5.09%	0.0%
0.00068		6	33.9	31.1	36.6	31	37.6	1.07	2.62	7.72%	4.64%
0.0021		6	33.8	32.4	35.2	32.4	35.4	0.54	1.32	3.92%	4.97%
0.0064		6	34.7	33.1	36.3	32.2	36.2	0.628	1.54	4.43%	2.25%
0.019		6	31.9	27.3	36.5	26	38.4	1.77	4.34	13.6%	10.2%
0.057		6	18.3	16.1	20.6	16	20.8	0.879	2.15	11.7%	48.4%
0.17		6	11.4	10.1	12.7	10	13	0.503	1.23	10.8%	68.0%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00068		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0021		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0064		6	1	1	1	1	1	0	0	0.0%	0.0%
0.019		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.057		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	10.0%
0.17		6	0.6	0.6	0.6	0.6	0.6	0	0	0.0%	40.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.16	1.04	1.28	1.04	1.33	0.0471	0.115	9.94%	0.0%
0.00068		6	1.05	0.902	1.2	0.87	1.22	0.0577	0.141	13.5%	9.61%
0.0021		6	1.07	0.924	1.21	0.88	1.28	0.0556	0.136	12.8%	8.18%
0.0064		6	0.952	0.83	1.07	0.77	1.06	0.0471	0.115	12.1%	18.1%
0.019		6	0.8	0.598	1	0.63	1.15	0.0785	0.192	24.0%	31.1%
0.057		6	0.2	0.162	0.238	0.16	0.25	0.0148	0.0363	18.2%	82.8%
0.17		6	0.117	0.0921	0.141	0.07	0.13	0.00955	0.0234	20.0%	90.0%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	37.2	37.6	35.8	35.8	33.2	33.6
0.00068		36.5	33.2	31	31.8	37.6	33.2
0.0021		35	34.4	32.6	32.8	35.4	32.4
0.0064		35.2	33.8	34.8	36.2	36.2	32.2
0.019		34.8	38.4	29.4	30.4	32.4	26
0.057		16	20.8	16	18.5	20.8	18
0.17		12.7	13	11	11.3	10	10.3

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00068		0.8	1	1	1	1	1
0.0021		1	1	1	1	1	1
0.0064		1	1	1	1	1	1
0.019		1	1	1	1	1	0.8
0.057		1	0.8	0.8	0.8	1	1
0.17		0.6	0.6	0.6	0.6	0.6	0.6

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.09	1.33	1.16	1.27	1.04	1.08
0.00068		1.16	0.87	0.97	0.94	1.22	1.14
0.0021		1.15	1.02	1.01	0.88	1.28	1.06
0.0064		1.02	0.98	1.03	0.77	1.06	0.85
0.019		0.88	1.15	0.66	0.73	0.75	0.63
0.057		0.16	0.25	0.16	0.22	0.19	0.22
0.17		0.13	0.13	0.13	0.07	0.12	0.12

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	05-2271-9160	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	13 Feb-17 06:30	**Species:**	Zea mays	**Brine:**	
Duration:	147d 7h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	19-5180-0533	**Code:**	50103801 d-corn	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	13 Feb-17 06:30	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Dicamba acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-4938-5022	Height	0.018	0.055	0.03146	15.1%		Dunnett Multiple Comparison Test
07-2618-9443	Height	0.018	0.055	0.03146	11.2%		Williams Multiple Comparison Test
12-7682-6758	Survival	0.018	0.055	0.03146	7.22%		Mann-Whitney U Two-Sample Test
06-3671-7766	Weight	0.006	0.018	0.01039	26.6%		Dunnett Multiple Comparison Test
05-8991-0098	Weight	0.006	0.018	0.01039	19.7%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
13-3812-0245	Height	IC5	0.0139	0.00478	0.0188		Nonlinear Regression
		IC10	0.019	0.0123	0.0246		
		IC25	0.032	0.0259	0.0382		
		IC50	0.0569	0.0495	0.0656		
14-9777-5793	Survival	EC5	0.0358	0.022	0.0466		Linear Regression (MLE)
		EC10	0.0426	0.0284	0.0536		
		EC25	0.0568	0.0427	0.0689		
		EC50	0.0781	0.0638	0.0959		
07-6662-9293	Survival	EC50	0.0784	0.0635	0.0968		Trimmed Spearman-Kärber
10-4720-3366	Weight	IC5	0.0133	N/A	0.0185		Nonlinear Regression
		IC10	0.0167	N/A	0.0226		
		IC25	0.0246	0.0173	0.0317		
		IC50	0.0378	0.0309	0.0463		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	113	110	117	109	117	1.3	3.19	2.82%	0.0%
0.00067		6	106	94.2	118	97	128	4.72	11.6	10.9%	6.04%
0.002		6	109	98.7	118	95	123	3.8	9.31	8.58%	4.12%
0.006		6	110	101	119	100	122	3.47	8.51	7.74%	2.8%
0.018		6	107	98.4	115	96	116	3.16	7.74	7.27%	5.89%
0.055		6	52.2	41.5	62.8	43	70	4.15	10.2	19.5%	53.9%
0.16		2	28	28	28	28	28	0	0	0.0%	75.3%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00067		6	1	1	1	1	1	0	0	0.0%	0.0%
0.002		6	1	1	1	1	1	0	0	0.0%	0.0%
0.006		6	1	1	1	1	1	0	0	0.0%	0.0%
0.018		6	1	1	1	1	1	0	0	0.0%	0.0%
0.055		6	0.767	0.609	0.925	0.6	1	0.0615	0.151	19.6%	23.3%
0.16		6	0.0667	0	0.175	0	0.2	0.0422	0.103	155.0%	93.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	5.65	5.12	6.18	5.07	6.4	0.206	0.504	8.91%	0.0%
0.00067		6	4.91	3.72	6.1	4.01	7.01	0.461	1.13	23.0%	13.1%
0.002		6	4.83	3.88	5.77	3.65	6.16	0.369	0.904	18.7%	14.6%
0.006		6	5.19	4.35	6.03	4.21	6.25	0.326	0.797	15.4%	8.17%
0.018		6	4.53	3.91	5.15	3.86	5.42	0.242	0.592	13.1%	19.9%
0.055		6	1.42	0.865	1.98	0.69	1.97	0.217	0.53	37.3%	74.8%
0.16		2	0.27	0.27	0.27	0.27	0.27	0	0	0.0%	95.2%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	113	110	114	116	117	109
0.00067		104	110	128	97	100	99
0.002		113	104	95	108	123	108
0.006		111	122	102	117	100	108
0.018		100	114	96	116	106	107
0.055		58	46	70	50	46	43
0.16					28	28	

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00067		1	1	1	1	1	1
0.002		1	1	1	1	1	1
0.006		1	1	1	1	1	1
0.018		1	1	1	1	1	1
0.055		0.8	1	0.8	0.6	0.8	0.6
0.16		0	0	0	0.2	0.2	0

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	5.51	5.88	5.89	6.4	5.16	5.07
0.00067		5.14	4.94	7.01	4.03	4.01	4.33
0.002		5.61	4.47	3.65	4.6	6.16	4.46
0.006		6.05	6.25	4.73	5.07	4.21	4.83
0.018		5.42	4.79	3.88	4.53	4.68	3.86
0.055		1.94	1.52	1.97	1.52	0.89	0.69
0.16					0.27	0.27	

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) — **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	06-6088-0961	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	11 Feb-17 17:42	**Species:**	Lactuca sativa	**Brine:**	
Duration:	150d 18h	**Source:**	Sustainable Seed Co., CA	**Age:**	
Sample ID:	14-8617-7883	**Code:**	50103801 d-lett	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	11 Feb-17 17:42	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - Dicamba acid measured test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-6244-0531	Height	0.0064	0.019	0.01103	15.3%		Dunnett Multiple Comparison Test
04-2203-8179	Height	0.0064	0.019	0.01103	11.4%		Williams Multiple Comparison Test
16-1952-0758	Survival	0.019	0.057	0.03291	NA		Jonckheere-Terpstra Step-Down Test
09-1407-8715	Survival	0.019	0.057	0.03291	14.9%		Mann-Whitney U Two-Sample Test
19-0135-9139	Weight	0.00068	0.0021	0.001195	NA		Jonckheere-Terpstra Step-Down Test
03-8919-3163	Weight	0.0021	0.0064	0.003666	23.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
00-3588-1387	Height	IC5	0.00526	0.00132	0.00816		Nonlinear Regression
		IC10	0.00836	0.00463	0.012		
		IC25	0.0181	0.0132	0.0237		
		IC50	0.0429	0.0349	0.0528		
07-2704-8959	Survival	EC5	0.000688	9.88E-05	0.00192		Linear Regression (MLE)
		EC10	0.00228	0.000581	0.00509		
		EC25	0.017	0.00818	0.0358		
		EC50	0.157	0.0668	0.72		
21-1896-3540	Survival	EC50	0.0984	0.0743	0.13		Trimmed Spearman-Kärber
04-6182-2828	Weight	IC5	0.000392	N/A	0.00112		Nonlinear Regression
		IC10	0.000751	N/A	0.00166		
		IC25	0.00223	0.000986	0.00412		
		IC50	0.00744	0.00453	0.0122		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	27.6	26.2	29	25.6	29.8	0.556	1.36	4.94%	0.0%
0.00023		6	27.8	24.2	31.5	21.4	31	1.43	3.5	12.6%	-0.85%
0.00068		6	27.2	24.8	29.6	23	30	0.944	2.31	8.5%	1.45%
0.0021		6	29.2	26.6	31.8	25.5	32.6	1.01	2.46	8.45%	-5.68%
0.0064		6	27.3	24	30.6	23.6	31.5	1.29	3.16	11.6%	1.15%
0.019		6	21.5	16.1	26.9	13	27.2	2.1	5.13	23.9%	22.0%
0.057		6	9.18	6.07	12.3	4	13	1.21	2.96	32.3%	66.7%
0.17		6	6.5	4.91	8.09	4	8	0.619	1.52	23.3%	76.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	0.0%
0.00023		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	3.45%
0.00068		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	6.9%
0.0021		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	6.9%
0.0064		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	3.45%
0.019		6	0.9	0.724	1	0.6	1	0.0683	0.167	18.6%	6.9%
0.057		6	0.7	0.48	0.92	0.4	1	0.0856	0.21	30.0%	27.6%
0.17		6	0.267	0.0953	0.438	0.2	0.6	0.0667	0.163	61.2%	72.4%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.89	1.62	2.16	1.63	2.37	0.106	0.259	13.7%	0.0%
0.00023		6	2.38	1.67	3.09	1.62	3.23	0.276	0.676	28.4%	-25.6%
0.00068		6	1.51	0.905	2.12	0.71	2.3	0.237	0.58	38.3%	20.0%
0.0021		6	1.53	0.971	2.09	1.05	2.46	0.217	0.533	34.8%	19.1%
0.0064		6	1.24	0.678	1.8	0.81	2.2	0.217	0.532	43.1%	34.6%
0.019		6	0.585	0.364	0.806	0.25	0.85	0.0861	0.211	36.0%	69.1%
0.057		6	0.165	0.0897	0.24	0.06	0.26	0.0293	0.0718	43.5%	91.3%
0.17		6	0.103	0.0643	0.142	0.05	0.15	0.0152	0.0372	36.0%	94.5%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	27.6	29.8	27.8	27	27.8	25.6
0.00023		27.5	29.6	31	30.3	21.4	27.2
0.00068		26.8	27.8	23	27.8	30	27.8
0.0021		30.2	29.8	25.5	32.6	27.3	29.6
0.0064		23.6	25.4	26.6	30.8	25.8	31.5
0.019		21.8	27.2	26.4	13	20	20.7
0.057		13	4	8.3	9.8	10	10
0.17		7	4	6	8	8	6

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	0.8	1	1
0.00023		0.8	1	1	0.8	1	1
0.00068		0.8	1	0.8	1	0.8	1
0.0021		1	0.8	0.8	1	0.8	1
0.0064		1	1	1	1	0.8	0.8
0.019		1	1	1	0.8	1	0.6
0.057		0.6	0.4	0.8	1	0.6	0.8
0.17		0.2	0.2	0.2	0.2	0.2	0.6

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.63	1.85	1.86	1.71	1.93	2.37
0.00023		2	1.62	2.62	3.23	1.77	3.02
0.00068		0.71	1.59	1.02	1.54	2.3	1.92
0.0021		1.13	1.05	1.79	2.46	1.53	1.22
0.0064		0.81	0.94	1.01	2.2	0.94	1.52
0.019		0.57	0.77	0.85	0.25	0.55	0.52
0.057		0.23	0.06	0.15	0.16	0.13	0.26
0.17		0.07	0.05	0.11	0.15	0.13	0.11

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	08-6913-0466	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	10 Feb-17 19:22	**Species:**	Brassica napus	**Brine:**	
Duration:	149d 19h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	02-4548-2954	**Code:**	50103801 d-oils	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	10 Feb-17 19:22	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid -measured Dicamba acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-4252-6153	Height	0.019	0.057	0.03291	12.2%		Dunnett Multiple Comparison Test
05-0333-8683	Height	0.019	0.057	0.03291	9.31%		Williams Multiple Comparison Test
15-1738-9856	Survival	0.057	0.17	0.09844	9.69%		Mann-Whitney U Two-Sample Test
06-6580-1313	Weight	0.00068	0.0021	0.001195	NA		Jonckheere-Terpstra Step-Down Test
10-0851-0880	Weight	0.00068	0.0021	0.001195	8.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
18-1212-0519	Height	IC5	0.0317	0.0182	0.04		Nonlinear Regression
		IC10	0.0415	0.0305	0.0505		
		IC25	0.0649	0.0547	0.0753		
		IC50	0.107	0.095	0.12		
12-9409-0237	Survival	EC50	0.17	N/A	N/A		Trimmed Spearman-Kärber
02-8659-1375	Weight	IC5	0.0101	0.00435	0.0133		Nonlinear Regression
		IC10	0.0135	0.00921	0.0171		
		IC25	0.0221	0.018	0.0264		
		IC50	0.0382	0.0333	0.0439		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	37.2	35.9	38.6	35.6	38.6	0.535	1.31	3.52%	0.0%
0.00068		6	38.1	34.9	41.3	32.8	40.8	1.26	3.09	8.11%	-2.33%
0.0021		6	37.6	34.1	41.1	33	41.4	1.36	3.32	8.84%	-0.99%
0.0064		6	38.2	36.1	40.3	35.2	40.4	0.816	2	5.24%	-2.6%
0.019		6	36.3	33.9	38.7	32.4	38.2	0.915	2.24	6.17%	2.51%
0.057		6	30.3	25.3	35.4	23.8	37.8	1.96	4.81	15.9%	18.5%
0.17		6	9.88	4.96	14.8	6	18.5	1.91	4.69	47.5%	73.5%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00068		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0021		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0064		6	1	1	1	1	1	0	0	0.0%	0.0%
0.019		6	1	1	1	1	1	0	0	0.0%	0.0%
0.057		6	1	1	1	1	1	0	0	0.0%	0.0%
0.17		6	0.5	0.243	0.757	0.2	0.8	0.1	0.245	49.0%	50.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	4.17	3.85	4.5	3.74	4.54	0.127	0.311	7.46%	0.0%
0.00068		6	3.94	3.63	4.24	3.66	4.35	0.119	0.292	7.41%	5.71%
0.0021		6	3.64	3.5	3.79	3.43	3.82	0.0574	0.141	3.86%	12.7%
0.0064		6	3.68	3.31	4.06	3.3	4.31	0.146	0.357	9.69%	11.8%
0.019		6	3.18	2.85	3.52	2.8	3.66	0.131	0.32	10.1%	23.8%
0.057		6	1.17	0.484	1.85	0.63	2.22	0.265	0.648	55.7%	72.1%
0.17		6	0.19	0.0805	0.299	0.11	0.39	0.0426	0.104	54.9%	95.4%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	35.6	37.8	37.6	38.2	38.6	35.6
0.00068		38.6	40.8	36.2	39.6	40.6	32.8
0.0021		33	40.2	38.4	38.4	41.4	34.2
0.0064		38	40.4	39.2	39.8	36.6	35.2
0.019		32.4	38.2	37.8	36.6	35	37.8
0.057		30	33.4	37.8	29.2	23.8	27.8
0.17		10	7.8	6	6	18.5	11

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00068		1	1	1	1	1	1
0.0021		1	1	1	1	1	1
0.0064		1	1	1	1	1	1
0.019		1	1	1	1	1	1
0.057		1	1	1	1	1	1
0.17		0.4	0.8	0.2	0.4	0.4	0.8

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	4.2	4.54	4.24	4.44	3.74	3.88
0.00068		4.15	3.68	4.06	4.35	3.66	3.71
0.0021		3.82	3.59	3.57	3.43	3.74	3.71
0.0064		4.31	3.85	3.47	3.55	3.61	3.3
0.019		3.2	2.85	3.24	3.34	3.66	2.8
0.057		0.82	1.72	2.22	0.87	0.63	0.73
0.17		0.19	0.11	0.15	0.11	0.39	0.19

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) — **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	19-4454-2616	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:		**Species:**	Allium cepa	**Brine:**	
Duration:	NA	**Source:**	Park Seed Co.	**Age:**	
Sample ID:	20-0024-2127	**Code:**	50103801 d-onio	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:		**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832; Dicamba + Glyphosate; measured dicamba test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-9281-6296	Height	0.018	0.055	0.03146	NA		Jonckheere-Terpstra Step-Down Test
02-2189-4386	Height	0.006	0.018	0.01039	10.8%		Mann-Whitney U Two-Sample Test
03-9791-5952	Survival	0.055	0.16	0.09381	9.8%		Mann-Whitney U Two-Sample Test
10-0294-2550	Weight	0.018	0.055	0.03146	30.5%		Dunnett Multiple Comparison Test
15-0787-0828	Weight	0.018	0.055	0.03146	23.3%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
07-3213-3334	Height	IC5	0.0163	0.00291	0.0252		Nonlinear Regression
		IC10	0.0254	0.0137	0.0365		
		IC25	0.053	0.0398	0.0679		
		IC50	0.12	0.0977	0.148		
04-4449-4972	Survival	EC5	0.0302	N/A	N/A		Linear Regression (MLE)
		EC10	0.0946	N/A	N/A		
		EC25	0.636	N/A	N/A		
		EC50	5.29	N/A	N/A		
11-7081-4544	Weight	IC5	0.00705	N/A	0.0152		Nonlinear Regression
		IC10	0.0112	N/A	0.0218		
		IC25	0.0244	0.0115	0.0414		
		IC50	0.0578	0.0376	0.0887		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	28.9	25.5	32.3	23	33	1.34	3.28	11.3%	0.0%
0.00067		6	27.3	24.8	29.8	23.5	30.8	0.966	2.37	8.67%	5.59%
0.002		6	27.8	23.8	31.7	22.6	32.4	1.53	3.76	13.5%	3.92%
0.006		6	27.1	23.4	30.8	21.4	31.4	1.42	3.49	12.9%	6.23%
0.018		6	26.7	24	29.4	21.6	28.6	1.05	2.56	9.58%	7.5%
0.055		6	20.4	17.4	23.4	15.4	23	1.15	2.81	13.8%	29.4%
0.16		6	11.5	9.06	13.8	7.8	14.2	0.928	2.27	19.9%	60.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00067		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.002		6	1	1	1	1	1	0	0	0.0%	0.0%
0.006		6	1	1	1	1	1	0	0	0.0%	0.0%
0.018		6	1	1	1	1	1	0	0	0.0%	0.0%
0.055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.16		6	0.767	0.521	1	0.4	1	0.0955	0.234	30.5%	23.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.19	0.128	0.251	0.136	0.296	0.0239	0.0585	30.8%	0.0%
0.00067		6	0.18	0.152	0.209	0.154	0.228	0.0112	0.0275	15.2%	4.92%
0.002		6	0.167	0.128	0.205	0.134	0.23	0.015	0.0366	22.0%	12.1%
0.006		6	0.168	0.109	0.228	0.11	0.234	0.0232	0.0568	33.7%	11.2%
0.018		6	0.161	0.108	0.215	0.082	0.222	0.0208	0.051	31.6%	14.9%
0.055		6	0.078	0.0587	0.0973	0.056	0.098	0.0075	0.0184	23.6%	58.9%
0.16		6	0.0473	0.0194	0.0753	0.024	0.1	0.0109	0.0266	56.2%	75.0%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	29	30	33	28.6	23	29.8
0.00067		28	27.8	27	26.6	23.5	30.8
0.002		29.2	32.4	23.8	29.2	29.4	22.6
0.006		27.4	31.4	21.4	29	25	28.4
0.018		27.2	27.4	27.8	27.8	28.6	21.6
0.055		22.6	20.6	15.4	21.6	23	19.2
0.16		11.5	7.8	14.2	10.7	11	13.5

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00067		1	1	1	1	0.8	1
0.002		1	1	1	1	1	1
0.006		1	1	1	1	1	1
0.018		1	1	1	1	1	1
0.055		1	1	1	1	1	1
0.16		0.8	1	1	0.6	0.4	0.8

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.186	0.208	0.296	0.168	0.144	0.136
0.00067		0.16	0.154	0.186	0.164	0.228	0.19
0.002		0.176	0.178	0.148	0.134	0.23	0.134
0.006		0.132	0.192	0.11	0.228	0.114	0.234
0.018		0.21	0.162	0.136	0.156	0.222	0.082
0.055		0.098	0.086	0.056	0.074	0.096	0.058
0.16		0.038	0.024	0.042	0.1	0.04	0.04

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	20-3441-2341	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	11 Feb-17 08:32	**Species:**	Lolium perenne	**Brine:**	
Duration:	145d 9h	**Source:**	Meyer Seed Co., Baltimore, MD	**Age:**	
Sample ID:	18-7910-0107	**Code:**	50103801 d-ryeg	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	11 Feb-17 08:32	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate - measured Dicamba test concentrations

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-5862-7880	Height	0.018	0.055	0.03146	NA		Jonckheere-Terpstra Step-Down Test
07-6972-9023	Height	0.055	0.16	0.09381	16.9%		Mann-Whitney U Two-Sample Test
09-4223-0016	Survival	0.055	0.16	0.09381	NA		Jonckheere-Terpstra Step-Down Test
07-8248-1294	Survival	0.055	0.16	0.09381	8.67%		Mann-Whitney U Two-Sample Test
16-5323-1971	Weight	0.018	0.055	0.03146	NA		Jonckheere-Terpstra Step-Down Test
05-5249-1409	Weight	0.018	0.055	0.03146	21.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
10-3382-5064	Height	IC5	0.00942	N/A	0.0198		Nonlinear Regression
		IC10	0.0185	0.00759	0.0319		
		IC25	0.0574	0.0366	0.0846		
		IC50	0.202	0.149	0.274		
06-0086-1570	Survival	EC5	0.0643	0.0335	0.0968		Linear Regression (MLE)
		EC10	0.0908	0.0528	0.129		
		EC25	0.162	0.11	0.215		
		EC50	0.307	0.232	0.409		
18-5951-4630	Survival	EC50	0.289	0.212	0.393		Trimmed Spearman-Kärber
06-7237-3603	Weight	IC5	0.0128	N/A	0.0194		Nonlinear Regression
		IC10	0.0179	0.00864	0.0251		
		IC25	0.0311	0.0224	0.0404		
		IC50	0.0575	0.047	0.0705		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	31.7	27.7	35.6	24.4	35	1.53	3.74	11.8%	0.0%
0.006		6	33.1	31.5	34.7	31.8	35.6	0.608	1.49	4.5%	-4.53%
0.018		6	32.9	31.4	34.4	31.4	34.8	0.586	1.43	4.37%	-3.79%
0.055		6	26.8	21.1	32.6	19.4	35	2.25	5.5	20.5%	15.3%
0.16		6	14.5	13	15.9	12.3	15.8	0.566	1.39	9.59%	54.4%
0.49		6	10.8	6.12	15.5	6	18	1.83	4.49	41.5%	65.8%
1.4		2	13.5	7.15	19.9	13	14	0.5	0.707	5.24%	57.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.006		6	1	1	1	1	1	0	0	0.0%	0.0%
0.018		6	1	1	1	1	1	0	0	0.0%	0.0%
0.055		6	1	1	1	1	1	0	0	0.0%	0.0%
0.16		6	0.667	0.495	0.838	0.4	0.8	0.0667	0.163	24.5%	33.3%
0.49		6	0.333	0.225	0.442	0.2	0.4	0.0422	0.103	31.0%	66.7%
1.4		6	0.0667	0	0.175	0	0.2	0.0422	0.103	155.0%	93.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.968	0.754	1.18	0.74	1.3	0.0834	0.204	21.1%	0.0%
0.006		6	1.01	0.874	1.14	0.84	1.18	0.0523	0.128	12.7%	-4.13%
0.018		6	0.885	0.683	1.09	0.76	1.27	0.0785	0.192	21.7%	8.61%
0.055		6	0.52	0.402	0.638	0.39	0.65	0.046	0.113	21.7%	46.3%
0.16		6	0.113	0.0748	0.152	0.08	0.18	0.015	0.0367	32.4%	88.3%
0.49		6	0.0767	0.0623	0.091	0.06	0.1	0.00558	0.0137	17.8%	92.1%
1.4		2	0.08	0.08	0.08	0.08	0.08	0	0	0.0%	91.7%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	24.4	31.6	35	33.2	33.4	32.4
0.006		34.2	35.6	32	31.8	32.4	32.6
0.018		31.6	34.8	31.4	32.8	32.2	34.4
0.055		19.4	23.2	25.2	27.8	30.4	35
0.16		13.3	15.3	12.3	15.5	14.5	15.8
0.49		10	7	6	10	14	18
1.4			13				14

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.006		1	1	1	1	1	1
0.018		1	1	1	1	1	1
0.055		1	1	1	1	1	1
0.16		0.6	0.8	0.6	0.4	0.8	0.8
0.49		0.4	0.4	0.2	0.4	0.4	0.2
1.4		0	0.2	0	0	0	0.2

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.77	1.01	0.74	1.04	1.3	0.95
0.006		0.88	1.01	1.08	1.06	0.84	1.18
0.018		0.76	1.27	0.84	0.8	0.78	0.86
0.055		0.39	0.4	0.5	0.64	0.54	0.65
0.16		0.08	0.12	0.09	0.18	0.12	0.09
0.49		0.06	0.08	0.07	0.07	0.08	0.1
1.4			0.08				0.08

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) — **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	07-5846-8818	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	11 Feb-17 17:16	**Species:**	Triticum aestivum	**Brine:**	
Duration:	145d 17h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	20-1935-2911	**Code:**	50103801 d-whea	**Client:**	CDM Smith - T. Nelis
Sample Date:	11 Feb-17 17:16	**Material:**	Dicamba (#1918-00-9)	**Project:**	
Receive Date:	11 Feb-17 17:16	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate - Dicamba acid measured test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-7409-0897	Height	0.006	0.018	0.01039	6.69%		Dunnett Multiple Comparison Test
12-4904-0225	Height	0.006	0.018	0.01039	4.85%		Williams Multiple Comparison Test
19-1390-4339	Survival	0.018	0.055	0.03146	NA		Jonckheere-Terpstra Step-Down Test
05-4531-8173	Survival	0.055	0.16	0.09381	7.27%		Mann-Whitney U Two-Sample Test
00-5796-8261	Weight	0.018	0.055	0.03146	23.0%		Dunnett Multiple Comparison Test
09-7056-3072	Weight	0.018	0.055	0.03146	16.7%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
11-0206-4675	Height	IC5	0.01	0.00712	0.0127		Nonlinear Regression
		IC10	0.0165	0.0131	0.0199		
		IC25	0.0377	0.0333	0.0424		
		IC50	0.0947	0.0831	0.108		
16-3643-5793	Survival	EC5	0.0521	0.0354	0.0652		Linear Regression (MLE)
		EC10	0.0598	0.0431	0.0733		
		EC25	0.0755	0.059	0.0903		
		EC50	0.0978	0.081	0.118		
03-6813-0458	Survival	EC50	0.0958	0.0874	0.105		Trimmed Spearman-Kärber
11-5122-4262	Weight	IC5	0.0118	N/A	0.0151		Nonlinear Regression
		IC10	0.015	0.0101	0.0185		
		IC25	0.0221	0.0179	0.0263		
		IC50	0.0342	0.0297	0.0394		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	56.5	55.9	57.2	55.8	57.6	0.262	0.641	1.13%	0.0%
0.00022		6	56.3	54.8	57.7	54	58.2	0.563	1.38	2.45%	0.47%
0.00067		6	56.5	54.7	58.3	53.6	58	0.685	1.68	2.97%	0.06%
0.002		6	57.1	55.2	59	53.8	58.8	0.733	1.8	3.14%	-1.06%
0.006		6	56.3	53.5	59	53	60.4	1.07	2.62	4.65%	0.47%
0.018		6	53.1	51.6	54.6	51	54.6	0.574	1.41	2.65%	6.07%
0.055		6	34.4	31.5	37.3	31.2	38.6	1.13	2.77	8.04%	39.1%
0.16		2	24.5	5.44	43.6	23	26	1.5	2.12	8.66%	56.7%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00022		6	1	1	1	1	1	0	0	0.0%	0.0%
0.00067		6	1	1	1	1	1	0	0	0.0%	0.0%
0.002		6	1	1	1	1	1	0	0	0.0%	0.0%
0.006		6	1	1	1	1	1	0	0	0.0%	0.0%
0.018		6	1	1	1	1	1	0	0	0.0%	0.0%
0.055		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	6.67%
0.16		6	0.1	0	0.276	0	0.4	0.0683	0.167	167.0%	90.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.37	1.23	1.5	1.19	1.5	0.0514	0.126	9.23%	0.0%
0.00022		6	1.47	1.27	1.66	1.19	1.67	0.077	0.189	12.9%	-7.45%
0.00067		6	1.45	1.26	1.63	1.22	1.62	0.0722	0.177	12.2%	-6.11%
0.002		6	1.46	1.23	1.68	1.17	1.68	0.0884	0.216	14.9%	-6.72%
0.006		6	1.43	1.28	1.57	1.28	1.57	0.058	0.142	9.97%	-4.4%
0.018		6	1.21	1.06	1.36	0.99	1.35	0.0581	0.142	11.8%	11.6%
0.055		6	0.327	0.238	0.415	0.21	0.43	0.0343	0.0841	25.7%	76.1%
0.16		2	0.08	-0.0471	0.207	0.07	0.09	0.01	0.0141	17.7%	94.1%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	56.6	56	56.8	56.4	57.6	55.8
0.00022		56.2	58.2	56.6	55.8	54	56.8
0.00067		56.8	57	58	55.6	53.6	58
0.002		58.8	58	57.4	58.2	53.8	56.6
0.006		56.2	53	60.4	57.4	56.6	54
0.018		53.6	51	53.4	51.8	54.2	54.6
0.055		33	38.6	34.6	31.2	32.5	36.6
0.16			23			26	

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00022		1	1	1	1	1	1
0.00067		1	1	1	1	1	1
0.002		1	1	1	1	1	1
0.006		1	1	1	1	1	1
0.018		1	1	1	1	1	1
0.055		0.8	1	1	1	0.8	1
0.16		0	0.2	0	0	0.4	0

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.31	1.19	1.5	1.41	1.5	1.28
0.00022		1.19	1.5	1.29	1.67	1.53	1.62
0.00067		1.22	1.61	1.62	1.29	1.37	1.58
0.002		1.67	1.17	1.68	1.46	1.23	1.53
0.006		1.52	1.3	1.57	1.57	1.28	1.31
0.018		1.29	1.07	0.99	1.27	1.27	1.35
0.055		0.31	0.43	0.29	0.21	0.42	0.3
0.16			0.09			0.07	

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	16-8539-3697	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 17:30	**Species:**	Brassica oleracea	**Brine:**	
Duration:	151d 17h	**Source:**	Sustainable Seed Co., CA	**Age:**	
Sample ID:	19-2633-8036	**Code:**	50103801 g-cabb	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 17:30	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-9774-7366	Height	0.035	0.11	0.06205	9.59%		Dunnett Multiple Comparison Test
17-9667-4420	Height	0.035	0.11	0.06205	7.31%		Williams Multiple Comparison Test
16-8164-2685	Survival	0.11	0.32	0.1876	8.78%		Mann-Whitney U Two-Sample Test
20-6770-1861	Weight	0.012	0.035	0.02049	NA		Jonckheere-Terpstra Step-Down Test
06-5823-5946	Weight	0.012	0.035	0.02049	8.28%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
07-6382-8358	Height	IC5	0.0158	0.00499	0.0262		Nonlinear Regression
		IC10	0.0287	0.0164	0.0423		
		IC25	0.0777	0.0567	0.103		
		IC50	0.235	0.19	0.29		
16-8979-8501	Survival	EC5	0.177	0.0898	0.253		Linear Regression (MLE)
		EC10	0.231	0.134	0.314		
		EC25	0.361	0.253	0.464		
		EC50	0.592	0.46	0.798		
08-7299-1748	Survival	EC50	0.578	0.451	0.742		Trimmed Spearman-Kärber
10-3059-1037	Weight	IC5	0.0193	0.0116	0.0241		Nonlinear Regression
		IC10	0.0251	0.0191	0.0301		
		IC25	0.039	0.0332	0.0449		
		IC50	0.0637	0.0568	0.0714		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	26.1	25.1	27	24.6	27.4	0.371	0.909	3.49%	0.0%
0.0037		6	27.3	26	28.6	25.8	29	0.497	1.22	4.46%	-4.73%
0.012		6	27.2	25.2	29.3	24	29.2	0.792	1.94	7.13%	-4.48%
0.035		6	27.6	24.7	30.5	24	32	1.13	2.77	10.0%	-5.75%
0.11		6	16.9	14.8	18.9	14.8	19.4	0.806	1.97	11.7%	35.3%
0.32		6	9.65	8.14	11.2	8.3	11.7	0.589	1.44	15.0%	63.0%
0.97		6	8.25	6.32	10.2	6	11	0.75	1.84	22.3%	68.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0037		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	1	1	1	1	1	0	0	0.0%	0.0%
0.32		6	0.767	0.56	0.973	0.6	1	0.0803	0.197	25.6%	23.3%
0.97		6	0.267	0.158	0.375	0.2	0.4	0.0422	0.103	38.7%	73.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	3.54	3.11	3.96	2.86	3.97	0.165	0.404	11.4%	0.0%
0.0037		6	3.73	3.37	4.09	3.12	4.08	0.14	0.343	9.19%	-5.47%
0.012		6	3.58	3.19	3.96	2.98	4.13	0.15	0.368	10.3%	-1.13%
0.035		6	2.91	2.58	3.24	2.44	3.35	0.129	0.316	10.9%	17.7%
0.11		6	0.777	0.612	0.941	0.58	0.96	0.064	0.157	20.2%	78.0%
0.32		6	0.238	0.149	0.327	0.15	0.38	0.0347	0.085	35.6%	93.3%
0.97		6	0.218	0.198	0.239	0.2	0.25	0.00792	0.0194	8.89%	93.8%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	27.4	24.6	25.8	26	26.4	26.2
0.0037		28	25.8	29	26	27.4	27.6
0.012		26.2	24	27	28.8	28.2	29.2
0.035		28	24	29	26.2	26.2	32
0.11		16	19	17	19.4	14.8	15
0.32		8.8	8.3	11.7	11	8.3	9.8
0.97		6.5	9	8	6	11	9

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0037		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		1	1	1	1	1	1
0.32		1	0.8	0.6	0.6	0.6	1
0.97		0.4	0.2	0.2	0.4	0.2	0.2

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	3.79	2.86	3.97	3.3	3.54	3.76
0.0037		3.69	3.7	3.76	4.08	4.03	3.12
0.012		3.62	3.65	4.13	2.98	3.5	3.58
0.035		2.75	3.35	2.91	3.15	2.44	2.87
0.11		0.68	0.96	0.66	0.92	0.86	0.58
0.32		0.15	0.22	0.38	0.28	0.16	0.24
0.97		0.2	0.25	0.2	0.23	0.21	0.22

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	20-8851-5427	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 17:53	**Species:**	Daucus carota	**Brine:**	
Duration:	151d 18h	**Source:**	Meyer Seed Co., Baltimore, MD	**Age:**	
Sample ID:	13-7582-7694	**Code:**	50103801 g-carr	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 17:53	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamaba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-8604-0563	Height	0.012	0.035	0.02049	9.17%		Dunnett Multiple Comparison Test
18-3776-0690	Height	0.012	0.035	0.02049	6.99%		Williams Multiple Comparison Test
03-0106-2210	Survival	0.035	0.11	0.06205	NA		Jonckheere-Terpstra Step-Down Test
01-0448-0446	Survival	0.11	0.32	0.1876	6.3%		Mann-Whitney U Two-Sample Test
15-4963-1813	Weight	0.0037	0.012	0.006663	NA		Jonckheere-Terpstra Step-Down Test
15-0810-5543	Weight	0.0037	0.012	0.006663	11.0%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
10-7020-9023	Height	IC5	0.017	0.00903	0.0241		Nonlinear Regression
		IC10	0.0276	0.0187	0.0365		
		IC25	0.0617	0.0496	0.075		
		IC50	0.151	0.13	0.175		
18-7855-5716	Survival	EC5	0.0245	N/A	N/A		Linear Regression (MLE)
		EC10	0.0561	N/A	N/A		
		EC25	0.224	N/A	N/A		
		EC50	1.04	N/A	N/A		
19-1653-1401	Weight	IC5	0.0113	N/A	0.0166		Nonlinear Regression
		IC10	0.0161	0.00898	0.0221		
		IC25	0.029	0.0216	0.037		
		IC50	0.0558	0.0459	0.0678		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	35.5	33.6	37.4	33.2	37.6	0.739	1.81	5.09%	0.0%
0.0013		6	33.9	31.1	36.6	31	37.6	1.07	2.62	7.72%	4.64%
0.0037		6	33.8	32.4	35.2	32.4	35.4	0.54	1.32	3.92%	4.97%
0.012		6	34.7	33.1	36.3	32.2	36.2	0.628	1.54	4.43%	2.25%
0.035		6	31.9	27.3	36.5	26	38.4	1.77	4.34	13.6%	10.2%
0.11		6	18.3	16.1	20.6	16	20.8	0.879	2.15	11.7%	48.4%
0.32		6	11.4	10.1	12.7	10	13	0.503	1.23	10.8%	68.0%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0013		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0037		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.11		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	10.0%
0.32		6	0.6	0.6	0.6	0.6	0.6	0	0	0.0%	40.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.16	1.04	1.28	1.04	1.33	0.0471	0.115	9.94%	0.0%
0.0013		6	1.05	0.902	1.2	0.87	1.22	0.0577	0.141	13.5%	9.61%
0.0037		6	1.07	0.924	1.21	0.88	1.28	0.0556	0.136	12.8%	8.18%
0.012		6	0.952	0.83	1.07	0.77	1.06	0.0471	0.115	12.1%	18.1%
0.035		6	0.8	0.598	1	0.63	1.15	0.0785	0.192	24.0%	31.1%
0.11		6	0.2	0.162	0.238	0.16	0.25	0.0148	0.0363	18.2%	82.8%
0.32		6	0.117	0.0921	0.141	0.07	0.13	0.00955	0.0234	20.0%	90.0%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	37.2	37.6	35.8	35.8	33.2	33.6
0.0013		36.5	33.2	31	31.8	37.6	33.2
0.0037		35	34.4	32.6	32.8	35.4	32.4
0.012		35.2	33.8	34.8	36.2	36.2	32.2
0.035		34.8	38.4	29.4	30.4	32.4	26
0.11		16	20.8	16	18.5	20.8	18
0.32		12.7	13	11	11.3	10	10.3

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0013		0.8	1	1	1	1	1
0.0037		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	0.8
0.11		1	0.8	0.8	0.8	1	1
0.32		0.6	0.6	0.6	0.6	0.6	0.6

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.09	1.33	1.16	1.27	1.04	1.08
0.0013		1.16	0.87	0.97	0.94	1.22	1.14
0.0037		1.15	1.02	1.01	0.88	1.28	1.06
0.012		1.02	0.98	1.03	0.77	1.06	0.85
0.035		0.88	1.15	0.66	0.73	0.75	0.63
0.11		0.16	0.25	0.16	0.22	0.19	0.22
0.32		0.13	0.13	0.13	0.07	0.12	0.12

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	02-1423-7782	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	13 Feb-17 06:42	**Species:**	Zea mays	**Brine:**	
Duration:	147d 7h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	12-6642-5879	**Code:**	50103801 g-corn	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	13 Feb-17 06:42	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-1492-1860	Height	0.035	0.11	0.06205	15.1%		Dunnett Multiple Comparison Test
19-6467-2987	Height	0.035	0.11	0.06205	11.2%		Williams Multiple Comparison Test
14-9552-8592	Survival	0.035	0.11	0.06205	7.22%		Mann-Whitney U Two-Sample Test
06-1017-9852	Weight	0.012	0.035	0.02049	26.6%		Dunnett Multiple Comparison Test
14-5155-5194	Weight	0.012	0.035	0.02049	19.7%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
10-8032-0949	Height	IC5	0.0269	0.0092	0.0366		Nonlinear Regression
		IC10	0.037	0.0237	0.0481		
		IC25	0.063	0.0509	0.0757		
		IC50	0.114	0.0986	0.132		
00-5469-7390	Survival	EC5	0.0708	0.0429	0.0927		Linear Regression (MLE)
		EC10	0.0845	0.0557	0.107		
		EC25	0.114	0.0848	0.139		
		EC50	0.158	0.128	0.195		
15-1958-2613	Survival	EC50	0.158	0.128	0.197		Trimmed Spearman-Kärber
02-9547-2069	Weight	IC5	0.0256	N/A	0.036		Nonlinear Regression
		IC10	0.0324	N/A	0.0442		
		IC25	0.0482	0.0336	0.0625		
		IC50	0.0749	0.0609	0.0922		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	113	110	117	109	117	1.3	3.19	2.82%	0.0%
0.0013		6	106	94.2	118	97	128	4.72	11.6	10.9%	6.04%
0.0038		6	109	98.7	118	95	123	3.8	9.31	8.58%	4.12%
0.012		6	110	101	119	100	122	3.47	8.51	7.74%	2.8%
0.035		6	107	98.4	115	96	116	3.16	7.74	7.27%	5.89%
0.11		6	52.2	41.5	62.8	43	70	4.15	10.2	19.5%	53.9%
0.33		2	28	28	28	28	28	0	0	0.0%	75.3%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0013		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0038		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	0.767	0.609	0.925	0.6	1	0.0615	0.151	19.6%	23.3%
0.33		6	0.0667	0	0.175	0	0.2	0.0422	0.103	155.0%	93.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	5.65	5.12	6.18	5.07	6.4	0.206	0.504	8.91%	0.0%
0.0013		6	4.91	3.72	6.1	4.01	7.01	0.461	1.13	23.0%	13.1%
0.0038		6	4.83	3.88	5.77	3.65	6.16	0.369	0.904	18.7%	14.6%
0.012		6	5.19	4.35	6.03	4.21	6.25	0.326	0.797	15.4%	8.17%
0.035		6	4.53	3.91	5.15	3.86	5.42	0.242	0.592	13.1%	19.9%
0.11		6	1.42	0.865	1.98	0.69	1.97	0.217	0.53	37.3%	74.8%
0.33		2	0.27	0.27	0.27	0.27	0.27	0	0	0.0%	95.2%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	113	110	114	116	117	109
0.0013		104	110	128	97	100	99
0.0038		113	104	95	108	123	108
0.012		111	122	102	117	100	108
0.035		100	114	96	116	106	107
0.11		58	46	70	50	46	43
0.33					28	28	

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0013		1	1	1	1	1	1
0.0038		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		0.8	1	0.8	0.6	0.8	0.6
0.33		0	0	0	0.2	0.2	0

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	5.51	5.88	5.89	6.4	5.16	5.07
0.0013		5.14	4.94	7.01	4.03	4.01	4.33
0.0038		5.61	4.47	3.65	4.6	6.16	4.46
0.012		6.05	6.25	4.73	5.07	4.21	4.83
0.035		5.42	4.79	3.88	4.53	4.68	3.86
0.11		1.94	1.52	1.97	1.52	0.89	0.69
0.33					0.27	0.27	

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	20-9214-4250	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 18:14	**Species:**	Lactuca sativa	**Brine:**	
Duration:	151d 18h	**Source:**	Sustainable Seed Co., CA	**Age:**	
Sample ID:	16-9775-8285	**Code:**	50103801 g-lett	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 18:14	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-3071-1882	Height	0.012	0.035	0.02049	15.3%		Dunnett Multiple Comparison Test
11-5043-0645	Height	0.012	0.035	0.02049	11.4%		Williams Multiple Comparison Test
09-5086-2588	Survival	0.035	0.11	0.06205	NA		Jonckheere-Terpstra Step-Down Test
06-5797-2370	Survival	0.035	0.11	0.06205	14.9%		Mann-Whitney U Two-Sample Test
03-0446-8978	Weight	0.0013	0.0037	0.002193	NA		Jonckheere-Terpstra Step-Down Test
08-8150-2695	Weight	0.0037	0.012	0.006663	23.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
02-8618-0833	Height	IC5	0.00973	0.00257	0.0151		Nonlinear Regression
		IC10	0.0155	0.00864	0.0224		
		IC25	0.034	0.0248	0.0446		
		IC50	0.0813	0.066	0.1		
13-1660-5329	Survival	EC5	0.00126	0.00018	0.00354		Linear Regression (MLE)
		EC10	0.00422	0.00107	0.00946		
		EC25	0.0317	0.0152	0.0672		
		EC50	0.298	0.126	1.37		
08-4534-5578	Survival	EC50	0.188	0.143	0.247		Trimmed Spearman-Kärber
21-1137-9964	Weight	IC5	0.00068	N/A	0.00198		Nonlinear Regression
		IC10	0.00132	2.82E-05	0.00293		
		IC25	0.00398	0.00176	0.00739		
		IC50	0.0136	0.00823	0.0225		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	27.6	26.2	29	25.6	29.8	0.556	1.36	4.94%	0.0%
0.00042		6	27.8	24.2	31.5	21.4	31	1.43	3.5	12.6%	-0.85%
0.0013		6	27.2	24.8	29.6	23	30	0.944	2.31	8.5%	1.45%
0.0037		6	29.2	26.6	31.8	25.5	32.6	1.01	2.46	8.45%	-5.68%
0.012		6	27.3	24	30.6	23.6	31.5	1.29	3.16	11.6%	1.15%
0.035		6	21.5	16.1	26.9	13	27.2	2.1	5.13	23.9%	22.0%
0.11		6	9.18	6.07	12.3	4	13	1.21	2.96	32.3%	66.7%
0.32		6	6.5	4.91	8.09	4	8	0.619	1.52	23.3%	76.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	0.0%
0.00042		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	3.45%
0.0013		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	6.9%
0.0037		6	0.9	0.785	1	0.8	1	0.0447	0.11	12.2%	6.9%
0.012		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	3.45%
0.035		6	0.9	0.724	1	0.6	1	0.0683	0.167	18.6%	6.9%
0.11		6	0.7	0.48	0.92	0.4	1	0.0856	0.21	30.0%	27.6%
0.32		6	0.267	0.0953	0.438	0.2	0.6	0.0667	0.163	61.2%	72.4%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.89	1.62	2.16	1.63	2.37	0.106	0.259	13.7%	0.0%
0.00042		6	2.38	1.67	3.09	1.62	3.23	0.276	0.676	28.4%	-25.6%
0.0013		6	1.51	0.905	2.12	0.71	2.3	0.237	0.58	38.3%	20.0%
0.0037		6	1.53	0.971	2.09	1.05	2.46	0.217	0.533	34.8%	19.1%
0.012		6	1.24	0.678	1.8	0.81	2.2	0.217	0.532	43.1%	34.6%
0.035		6	0.585	0.364	0.806	0.25	0.85	0.0861	0.211	36.0%	69.1%
0.11		6	0.165	0.0897	0.24	0.06	0.26	0.0293	0.0718	43.5%	91.3%
0.32		6	0.103	0.0643	0.142	0.05	0.15	0.0152	0.0372	36.0%	94.5%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	27.6	29.8	27.8	27	27.8	25.6
0.00042		27.5	29.6	31	30.3	21.4	27.2
0.0013		26.8	27.8	23	27.8	30	27.8
0.0037		30.2	29.8	25.5	32.6	27.3	29.6
0.012		23.6	25.4	26.6	30.8	25.8	31.5
0.035		21.8	27.2	26.4	13	20	20.7
0.11		13	4	8.3	9.8	10	10
0.32		7	4	6	8	8	6

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	0.8	1	1
0.00042		0.8	1	1	0.8	1	1
0.0013		0.8	1	0.8	1	0.8	1
0.0037		1	0.8	0.8	1	0.8	1
0.012		1	1	1	1	0.8	0.8
0.035		1	1	1	0.8	1	0.6
0.11		0.6	0.4	0.8	1	0.6	0.8
0.32		0.2	0.2	0.2	0.2	0.2	0.6

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.63	1.85	1.86	1.71	1.93	2.37
0.00042		2	1.62	2.62	3.23	1.77	3.02
0.0013		0.71	1.59	1.02	1.54	2.3	1.92
0.0037		1.13	1.05	1.79	2.46	1.53	1.22
0.012		0.81	0.94	1.01	2.2	0.94	1.52
0.035		0.57	0.77	0.85	0.25	0.55	0.52
0.11		0.23	0.06	0.15	0.16	0.13	0.26
0.32		0.07	0.05	0.11	0.15	0.13	0.11

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	08-4842-0985	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	14 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 18:31	**Species:**	Brassica napus	**Brine:**	
Duration:	151d 19h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	11-0735-2279	**Code:**	50103801 g-oils	**Client:**	CDM Smith - T. Nelis
Sample Date:	14 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 18:31	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-6551-9692	Height	0.035	0.11	0.06205	12.2%		Dunnett Multiple Comparison Test
15-3184-0211	Height	0.035	0.11	0.06205	9.31%		Williams Multiple Comparison Test
20-1235-2488	Survival	0.11	0.32	0.1876	9.69%		Mann-Whitney U Two-Sample Test
06-5624-4131	Weight	0.0013	0.0037	0.002193	NA		Jonckheere-Terpstra Step-Down Test
12-0740-5341	Weight	0.0013	0.0037	0.002193	8.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
04-3023-2176	Height	IC5	0.0623	0.0358	0.0782		Nonlinear Regression
		IC10	0.0809	0.0597	0.0982		
		IC25	0.125	0.106	0.145		
		IC50	0.204	0.181	0.228		
15-5383-0422	Survival	EC50	0.32	N/A	N/A		Trimmed Spearman-Kärber
01-5769-7958	Weight	IC5	0.0181	0.00805	0.024		Nonlinear Regression
		IC10	0.0246	0.0167	0.0312		
		IC25	0.041	0.0331	0.0492		
		IC50	0.0723	0.0627	0.0834		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	37.2	35.9	38.6	35.6	38.6	0.535	1.31	3.52%	0.0%
0.0013		6	38.1	34.9	41.3	32.8	40.8	1.26	3.09	8.11%	-2.33%
0.0037		6	37.6	34.1	41.1	33	41.4	1.36	3.32	8.84%	-0.99%
0.012		6	38.2	36.1	40.3	35.2	40.4	0.816	2	5.24%	-2.6%
0.035		6	36.3	33.9	38.7	32.4	38.2	0.915	2.24	6.17%	2.51%
0.11		6	30.3	25.3	35.4	23.8	37.8	1.96	4.81	15.9%	18.5%
0.32		6	9.88	4.96	14.8	6	18.5	1.91	4.69	47.5%	73.5%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0013		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0037		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	1	1	1	1	1	0	0	0.0%	0.0%
0.32		6	0.5	0.243	0.757	0.2	0.8	0.1	0.245	49.0%	50.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	4.17	3.85	4.5	3.74	4.54	0.127	0.311	7.46%	0.0%
0.0013		6	3.94	3.63	4.24	3.66	4.35	0.119	0.292	7.41%	5.71%
0.0037		6	3.64	3.5	3.79	3.43	3.82	0.0574	0.141	3.86%	12.7%
0.012		6	3.68	3.31	4.06	3.3	4.31	0.146	0.357	9.69%	11.8%
0.035		6	3.18	2.85	3.52	2.8	3.66	0.131	0.32	10.1%	23.8%
0.11		6	1.17	0.484	1.85	0.63	2.22	0.265	0.648	55.7%	72.1%
0.32		6	0.19	0.0805	0.299	0.11	0.39	0.0426	0.104	54.9%	95.4%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	35.6	37.8	37.6	38.2	38.6	35.6
0.0013		38.6	40.8	36.2	39.6	40.6	32.8
0.0037		33	40.2	38.4	38.4	41.4	34.2
0.012		38	40.4	39.2	39.8	36.6	35.2
0.035		32.4	38.2	37.8	36.6	35	37.8
0.11		30	33.4	37.8	29.2	23.8	27.8
0.32		10	7.8	6	6	18.5	11

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0013		1	1	1	1	1	1
0.0037		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		1	1	1	1	1	1
0.32		0.4	0.8	0.2	0.4	0.4	0.8

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	4.2	4.54	4.24	4.44	3.74	3.88
0.0013		4.15	3.68	4.06	4.35	3.66	3.71
0.0037		3.82	3.59	3.57	3.43	3.74	3.71
0.012		4.31	3.85	3.47	3.55	3.61	3.3
0.035		3.2	2.85	3.24	3.34	3.66	2.8
0.11		0.82	1.72	2.22	0.87	0.63	0.73
0.32		0.19	0.11	0.15	0.11	0.39	0.19

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) — **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	01-3286-7104	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 18:59	**Species:**	Allium cepa	**Brine:**	
Duration:	146d 19h	**Source:**	Park Seed Co.	**Age:**	
Sample ID:	02-8536-0311	**Code:**	50103801 g-onio	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 18:59	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-7049-6243	Height	0.035	0.11	0.06205	NA		Jonckheere-Terpstra Step-Down Test
01-0360-8545	Height	0.012	0.035	0.02049	10.8%		Mann-Whitney U Two-Sample Test
00-2975-9413	Survival	0.11	0.33	0.1905	9.8%		Mann-Whitney U Two-Sample Test
15-9298-0197	Weight	0.035	0.11	0.06205	30.5%		Dunnett Multiple Comparison Test
12-2613-0107	Weight	0.035	0.11	0.06205	23.3%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
20-1251-2275	Height	IC5	0.0314	0.00581	0.049		Nonlinear Regression
		IC10	0.0495	0.0264	0.0719		
		IC25	0.106	0.0788	0.136		
		IC50	0.246	0.199	0.305		
06-2979-6089	Survival	EC5	0.0607	N/A	N/A		Linear Regression (MLE)
		EC10	0.191	N/A	N/A		
		EC25	1.3	N/A	N/A		
		EC50	11	N/A	N/A		
14-1521-6242	Weight	IC5	0.0133	N/A	0.0291		Nonlinear Regression
		IC10	0.0214	N/A	0.0422		
		IC25	0.0476	0.0222	0.0816		
		IC50	0.116	0.0745	0.179		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	28.9	25.5	32.3	23	33	1.34	3.28	11.3%	0.0%
0.0013		6	27.3	24.8	29.8	23.5	30.8	0.966	2.37	8.67%	5.59%
0.0038		6	27.8	23.8	31.7	22.6	32.4	1.53	3.76	13.5%	3.92%
0.012		6	27.1	23.4	30.8	21.4	31.4	1.42	3.49	12.9%	6.23%
0.035		6	26.7	24	29.4	21.6	28.6	1.05	2.56	9.58%	7.5%
0.11		6	20.4	17.4	23.4	15.4	23	1.15	2.81	13.8%	29.4%
0.33		6	11.5	9.06	13.8	7.8	14.2	0.928	2.27	19.9%	60.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.0013		6	0.967	0.881	1	0.8	1	0.0333	0.0816	8.45%	3.33%
0.0038		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	1	1	1	1	1	0	0	0.0%	0.0%
0.33		6	0.767	0.521	1	0.4	1	0.0955	0.234	30.5%	23.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.19	0.128	0.251	0.136	0.296	0.0239	0.0585	30.8%	0.0%
0.0013		6	0.18	0.152	0.209	0.154	0.228	0.0112	0.0275	15.2%	4.92%
0.0038		6	0.167	0.128	0.205	0.134	0.23	0.015	0.0366	22.0%	12.1%
0.012		6	0.168	0.109	0.228	0.11	0.234	0.0232	0.0568	33.7%	11.2%
0.035		6	0.161	0.108	0.215	0.082	0.222	0.0208	0.051	31.6%	14.9%
0.11		6	0.078	0.0587	0.0973	0.056	0.098	0.0075	0.0184	23.6%	58.9%
0.33		6	0.0473	0.0194	0.0753	0.024	0.1	0.0109	0.0266	56.2%	75.0%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	29	30	33	28.6	23	29.8
0.0013		28	27.8	27	26.6	23.5	30.8
0.0038		29.2	32.4	23.8	29.2	29.4	22.6
0.012		27.4	31.4	21.4	29	25	28.4
0.035		27.2	27.4	27.8	27.8	28.6	21.6
0.11		22.6	20.6	15.4	21.6	23	19.2
0.33		11.5	7.8	14.2	10.7	11	13.5

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.0013		1	1	1	1	0.8	1
0.0038		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		1	1	1	1	1	1
0.33		0.8	1	1	0.6	0.4	0.8

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.186	0.208	0.296	0.168	0.144	0.136
0.0013		0.16	0.154	0.186	0.164	0.228	0.19
0.0038		0.176	0.178	0.148	0.134	0.23	0.134
0.012		0.132	0.192	0.11	0.228	0.114	0.234
0.035		0.21	0.162	0.136	0.156	0.222	0.082
0.11		0.098	0.086	0.056	0.074	0.096	0.058
0.33		0.038	0.024	0.042	0.1	0.04	0.04

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	12-7104-1727	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 19:10	**Species:**	Lolium perenne	**Brine:**	
Duration:	146d 19h	**Source:**	Meyer Seed Co., Baltimore, MD	**Age:**	
Sample ID:	06-0059-0083	**Code:**	50103801 g-ryeg	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 19:10	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
20-5061-4231	Height	0.035	0.11	0.06205	NA		Jonckheere-Terpstra Step-Down Test
01-9327-1494	Height	0.11	0.33	0.1905	16.9%		Mann-Whitney U Two-Sample Test
10-9347-2601	Survival	0.11	0.33	0.1905	NA		Jonckheere-Terpstra Step-Down Test
19-6310-6108	Survival	0.11	0.33	0.1905	8.67%		Mann-Whitney U Two-Sample Test
08-0372-2181	Weight	0.035	0.11	0.06205	NA		Jonckheere-Terpstra Step-Down Test
00-6732-0895	Weight	0.035	0.11	0.06205	21.8%		Mann-Whitney U Two-Sample Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
13-0088-3741	Height	IC5	0.0182	N/A	0.039		Nonlinear Regression
		IC10	0.0362	0.0145	0.0631		
		IC25	0.114	0.0721	0.17		
		IC50	0.411	0.3	0.562		
03-0700-4249	Survival	EC5	0.127	0.0645	0.193		Linear Regression (MLE)
		EC10	0.181	0.104	0.26		
		EC25	0.33	0.223	0.443		
		EC50	0.641	0.48	0.867		
17-8775-8237	Survival	EC50	0.603	0.438	0.83		Trimmed Spearman-Kärber
17-5410-8956	Weight	IC5	0.0246	N/A	0.0375		Nonlinear Regression
		IC10	0.0347	0.0166	0.049		
		IC25	0.0612	0.0438	0.0801		
		IC50	0.115	0.0936	0.142		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	31.7	27.7	35.6	24.4	35	1.53	3.74	11.8%	0.0%
0.012		6	33.1	31.5	34.7	31.8	35.6	0.608	1.49	4.5%	-4.53%
0.035		6	32.9	31.4	34.4	31.4	34.8	0.586	1.43	4.37%	-3.79%
0.11		6	26.8	21.1	32.6	19.4	35	2.25	5.5	20.5%	15.3%
0.33		6	14.5	13	15.9	12.3	15.8	0.566	1.39	9.59%	54.4%
1		6	10.8	6.12	15.5	6	18	1.83	4.49	41.5%	65.8%
3.3		2	13.5	7.15	19.9	13	14	0.5	0.707	5.24%	57.4%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	1	1	1	1	1	0	0	0.0%	0.0%
0.33		6	0.667	0.495	0.838	0.4	0.8	0.0667	0.163	24.5%	33.3%
1		6	0.333	0.225	0.442	0.2	0.4	0.0422	0.103	31.0%	66.7%
3.3		6	0.0667	0	0.175	0	0.2	0.0422	0.103	155.0%	93.3%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	0.968	0.754	1.18	0.74	1.3	0.0834	0.204	21.1%	0.0%
0.012		6	1.01	0.874	1.14	0.84	1.18	0.0523	0.128	12.7%	-4.13%
0.035		6	0.885	0.683	1.09	0.76	1.27	0.0785	0.192	21.7%	8.61%
0.11		6	0.52	0.402	0.638	0.39	0.65	0.046	0.113	21.7%	46.3%
0.33		6	0.113	0.0748	0.152	0.08	0.18	0.015	0.0367	32.4%	88.3%
1		6	0.0767	0.0623	0.091	0.06	0.1	0.00558	0.0137	17.8%	92.1%
3.3		2	0.08	0.08	0.08	0.08	0.08	0	0	0.0%	91.7%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	24.4	31.6	35	33.2	33.4	32.4
0.012		34.2	35.6	32	31.8	32.4	32.6
0.035		31.6	34.8	31.4	32.8	32.2	34.4
0.11		19.4	23.2	25.2	27.8	30.4	35
0.33		13.3	15.3	12.3	15.5	14.5	15.8
1		10	7	6	10	14	18
3.3			13				14

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		1	1	1	1	1	1
0.33		0.6	0.8	0.6	0.4	0.8	0.8
1		0.4	0.4	0.2	0.4	0.4	0.2
3.3		0	0.2	0	0	0	0.2

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	0.77	1.01	0.74	1.04	1.3	0.95
0.012		0.88	1.01	1.08	1.06	0.84	1.18
0.035		0.76	1.27	0.84	0.8	0.78	0.86
0.11		0.39	0.4	0.5	0.64	0.54	0.65
0.33		0.08	0.12	0.09	0.18	0.12	0.09
1		0.06	0.08	0.07	0.07	0.08	0.1
3.3			0.08				0.08

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Batch ID:	18-7145-6108	**Test Type:**	Vegetative Vigor Tier II	**Analyst:**	
Start Date:	19 Sep-16	**Protocol:**	OCSPP 850.4150 Plant Vegetative Vigor	**Diluent:**	
Ending Date:	12 Feb-17 19:40	**Species:**	Triticum aestivum	**Brine:**	
Duration:	146d 20h	**Source:**	Johnny's Selected Seeds, ME	**Age:**	
Sample ID:	00-4630-6263	**Code:**	50103801 g-whea	**Client:**	CDM Smith - T. Nelis
Sample Date:	19 Sep-16	**Material:**	Glyphosate	**Project:**	
Receive Date:	12 Feb-17 19:40	**Source:**	Monsanto Company		
Sample Age:	NA	**Station:**			

Batch Note: MON 76832 - Dicamba acid + Glyphosate acid - measured Glyphosate acid test concentrations.

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
21-3647-3878	Height	0.012	0.035	0.02049	6.69%		Dunnett Multiple Comparison Test
09-0115-2881	Height	0.012	0.035	0.02049	4.85%		Williams Multiple Comparison Test
17-8198-3802	Survival	0.11	0.33	0.1905	7.27%		Mann-Whitney U Two-Sample Test
13-1484-9288	Weight	0.035	0.11	0.06205	23.0%		Dunnett Multiple Comparison Test
12-9651-3626	Weight	0.035	0.11	0.06205	16.7%		Williams Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	lbs ae/A	95% LCL	95% UCL	TU	Method
10-8810-8706	Height	IC5	0.0192	0.0136	0.0246		Nonlinear Regression
		IC10	0.032	0.0253	0.0388		
		IC25	0.0747	0.0658	0.0843		
		IC50	0.192	0.168	0.22		
19-6918-4187	Survival	EC5	0.104	0.0699	0.131		Linear Regression (MLE)
		EC10	0.12	0.0855	0.148		
		EC25	0.152	0.118	0.183		
		EC50	0.199	0.164	0.24		
09-2709-7991	Survival	EC50	0.195	0.177	0.214		Trimmed Spearman-Kärber
08-0246-6015	Weight	IC5	0.0228	N/A	0.0292		Nonlinear Regression
		IC10	0.0289	0.0193	0.036		
		IC25	0.0432	0.0349	0.0515		
		IC50	0.0675	0.0584	0.0781		

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	56.5	55.9	57.2	55.8	57.6	0.262	0.641	1.13%	0.0%
0.00042		6	56.3	54.8	57.7	54	58.2	0.563	1.38	2.45%	0.47%
0.0013		6	56.5	54.7	58.3	53.6	58	0.685	1.68	2.97%	0.06%
0.0038		6	57.1	55.2	59	53.8	58.8	0.733	1.8	3.14%	-1.06%
0.012		6	56.3	53.5	59	53	60.4	1.07	2.62	4.65%	0.47%
0.035		6	53.1	51.6	54.6	51	54.6	0.574	1.41	2.65%	6.07%
0.11		6	34.4	31.5	37.3	31.2	38.6	1.13	2.77	8.04%	39.1%
0.33		2	24.5	5.44	43.6	23	26	1.5	2.12	8.66%	56.7%

Survival Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1	1	1	1	1	0	0	0.0%	0.0%
0.00042		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0013		6	1	1	1	1	1	0	0	0.0%	0.0%
0.0038		6	1	1	1	1	1	0	0	0.0%	0.0%
0.012		6	1	1	1	1	1	0	0	0.0%	0.0%
0.035		6	1	1	1	1	1	0	0	0.0%	0.0%
0.11		6	0.933	0.825	1	0.8	1	0.0422	0.103	11.1%	6.67%
0.33		6	0.1	0	0.276	0	0.4	0.0683	0.167	167.0%	90.0%

Weight Summary

C-lbs ae/A	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	6	1.37	1.23	1.5	1.19	1.5	0.0514	0.126	9.23%	0.0%
0.00042		6	1.47	1.27	1.66	1.19	1.67	0.077	0.189	12.9%	-7.45%
0.0013		6	1.45	1.26	1.63	1.22	1.62	0.0722	0.177	12.2%	-6.11%
0.0038		6	1.46	1.23	1.68	1.17	1.68	0.0884	0.216	14.9%	-6.72%
0.012		6	1.43	1.28	1.57	1.28	1.57	0.058	0.142	9.97%	-4.4%
0.035		6	1.21	1.06	1.36	0.99	1.35	0.0581	0.142	11.8%	11.6%
0.11		6	0.327	0.238	0.415	0.21	0.43	0.0343	0.0841	25.7%	76.1%
0.33		2	0.08	-0.0471	0.207	0.07	0.09	0.01	0.0141	17.7%	94.1%

OCSPP 850.4150 Terrestrial Plant Tier II (Vegetative Vigor) **EAG Laboratories (Wildlife Internat'l)**

Height Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	56.6	56	56.8	56.4	57.6	55.8
0.00042		56.2	58.2	56.6	55.8	54	56.8
0.0013		56.8	57	58	55.6	53.6	58
0.0038		58.8	58	57.4	58.2	53.8	56.6
0.012		56.2	53	60.4	57.4	56.6	54
0.035		53.6	51	53.4	51.8	54.2	54.6
0.11		33	38.6	34.6	31.2	32.5	36.6
0.33			23			26	

Survival Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1	1	1	1	1	1
0.00042		1	1	1	1	1	1
0.0013		1	1	1	1	1	1
0.0038		1	1	1	1	1	1
0.012		1	1	1	1	1	1
0.035		1	1	1	1	1	1
0.11		0.8	1	1	1	0.8	1
0.33		0	0.2	0	0	0.4	0

Weight Detail

C-lbs ae/A	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6
0	Negative Control	1.31	1.19	1.5	1.41	1.5	1.28
0.00042		1.19	1.5	1.29	1.67	1.53	1.62
0.0013		1.22	1.61	1.62	1.29	1.37	1.58
0.0038		1.67	1.17	1.68	1.46	1.23	1.53
0.012		1.52	1.3	1.57	1.57	1.28	1.31
0.035		1.29	1.07	0.99	1.27	1.27	1.35
0.11		0.31	0.43	0.29	0.21	0.42	0.3
0.33			0.09			0.07	